ACADEMY OF ACCOUNTING AND FINANCIAL STUDIES JOURNAL

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LETTER FROM THE EDITORS

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Dr. Janet Dye, University of Alaska Southeast, is the Accountancy Editor and Dr. Denise Woodbury, Weber State University is the Finance Editor. Their joint mission has been to make the *AAFSJ* better known and more widely read.

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MANUSCRIPTS

ANALYSTS' EVALUATION OF THE INFORMATION CONTENT OF CHANGES IN AUDITOR TYPES

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David H. Sinason, Northern Illinois University
Eric Typpo, University of the Pacific

ABSTRACT

Companies hire auditors to meet legal requirements if they are publicly traded and to provide credibility to their financial statements. However, all auditors may not provide the same level of service to third parties. Prior research regarding such events as initial public offerings has found qualitative differences among big Five and non-Big Five auditors. Companies may, therefore, switch auditors to attain some perceived qualitative difference in the audit engagement. The degree that this auditor change is or is not incorporated by financial analysts into analysts' forecasts has not been fully researched for the benefit of determining if there is any information content associated with the auditor change on security prices. The results of this study show that financial analysts do not fully incorporate information relative to auditor changes in their forecasts. This study might provide insight into the currently accepted view of the Efficient Market Hypothesis with respect to the information content of auditor changes and the market's interpretation of the information. In addition, analysts may need to scrutinize auditor changes more closely in order to fully understand the signal that may be included in the decision to change auditors.

INTRODUCTION

Financial analysts are one of the primary users of financial information. Analysts analyze publicly available information such as financial statements, and management earnings forecasts as well as non-public information obtained directly from firms they follow in order to make buy and sell recommendations and to make earnings forecasts. Given that the reward structure for analysts provides incentive for analysts to make accurate recommendations/forecasts, analysts expend considerable amounts of time and effort trying to uncover value relevant information about the companies and industries they follow.

This study will investigate whether information related to changes in auditor type is completely incorporated into analysts' earnings forecasts. It is generally accepted that large international (Big Five) auditors provide specific advantages and services to their clients that are not available from national auditors. Similarly, national auditors may provide specific advantages and services not available from regional auditors. A similar argument can be made when comparing widespread regional auditors with regional auditors that are more localized. Therefore, changes from national or regional auditors to Big Five auditors (or changes from Big Five auditors to

national or regional auditors) may provide information about the future demands and needs of the client. This information in turn may provide a signal regarding the future earnings of the client. Since providing earnings forecasts is one of the primary roles of analysts, they would be expected to incorporate the information into their expectation of company earnings in an unbiased fashion if the information has an impact on earnings. If there is a statistically significant difference between the analysts' forecast and the actual earnings, the analysts may not have completely captured the information signaled by the change in auditor type.

The remainder of the paper is structured in the following manner. Section 2 outlines the theory utilized in developing the hypotheses. Section 3 describes the hypotheses tested. Section 4 specifies the methodology used for testing. Section 5 is the discussion of results and section 6 indicates the conclusions of the paper.

THEORY

Companies hire auditors to meet legal requirements if they are publicly traded and to provide credibility to their financial statements. The auditor provides an independent appraisal of the financial statements' correspondence to Generally Accepted Accounting Principles (GAAP), and the auditor's report provides assurance to third parties using the financial statements to make decisions. Research has shown that economic rewards accrue to companies who elect to get their financial statements audited. Blackwell, Noland and Winters (1998) found companies that engaged CPAs to perform an audit of their financial statements were able to obtain financing at a lower interest rate relative to companies with unaudited financial statements.

However, all auditors may not provide the same level of service and assurance to third parties. Auditing expertise, improved training, enhanced technology, and other client services are more readily available from a Big Five audit firm compared to national or regional audit firms. Previous research regarding other events such as initial public offerings has found that the Big Five are viewed as quality differentiated auditors relative to the non-Big Five firms. Research into initial public offerings (IPO) (Willenborg, 1999) has found that companies that engage a Big Five auditor command a higher share price when compared to companies that engage smaller audit firm. Teoh and Wong (1993) found that earnings response coefficients for firms changing to Big Five auditors were significantly larger than firms changing to smaller firms. This finding implies that the market assesses earnings surprises from companies audited by a Big Five auditor differently relative to companies audited by smaller firms. These results are consistent with the theory that audits by Big Five firms are viewed as more desirable than audits by smaller firms from the perspective of third parties. However, these additional benefits generally come at a higher cost in the form of larger audit fees.

While not a common event for most companies, changes in auditors do occur. The change may be client initiated due to dissatisfaction with service or fees, or the change may be auditor initiated due to a desire to reduce the risk level of their client base, or to eliminate less profitable clients. A change in auditors is an event that can carry information to third parties and result in economic consequences for the client. Wells and Loudder (1997) found that auditor-initiated auditor

changes resulted in a negative stock price reaction for the client at the time the event is disclosed on form 8K, since an auditor-initiated change often results for reasons that reflect negatively on the client. Dhaliwal, Schatzberg and Trombley (1993) find that firms who change auditors after a disagreement with auditors have poorer earning and stock performance relative to firms who change auditors without a disagreement. Additionally, they find some evidence that firms who had a disagreement are more likely to switch to a smaller auditor, possibly to reduce auditor scrutiny. Wallace (1998) finds that firms which engaged a big 5 auditor after an auditor switch benefited from the change in the form of reduced cost of capital.

At the time an auditor change occurs, the client can elect to make a "lateral" change by selecting a new auditor of the same type. Depending on the former auditor, the company can also elect to go "upstream" (regional to national auditor; or a national to international auditor) or "downstream" (international auditor to a national auditor; or a national auditor to a regional auditor) with the new auditor. Upstream changes could be for a number of reasons including:

♦   outgrowing the audit services available from the current auditor,
♦   requiring non-audit services (e.g. consulting service, tax planning service, computer technology, investment service) that are not available from the smaller auditor,
♦   desiring an auditor with a prominent national or international reputation to satisfy investors and/or creditors
♦   requiring an auditor with a greater geographic disbursement to meet company growth

Conversely, downstream changes may occur for a number of reasons including:

♦   cost reduction
♦   a desire to have a less trained, less technical evaluation of the company (possibly in an attempt to hide irregularities in the business)
♦   to be a more important client to an auditor
♦   the firm being perceived as too risky for a Big Five auditor

While the actual reason for the auditor change may not be known, and is generally not disclosed in great detail on the 8K (Wells & Loudder, 1997), a general proposition may be formulated from the preceding list. Upstream changes are generally the result of positive factors, while downstream changes are often the result of factors that are negative. It may be that the decision to make an upstream change is due to client growth requiring new services or greater scope in audit services. On the other hand, a downstream change may indicate a need for cost cutting or a decline in the business. Further, such a change could indicate the desire of the company to have an audit of diminished scope or scrutiny.

Because a Big Five audit is generally more expensive than an audit by a smaller firm, an upstream change is unlikely unless the company has a compelling reason to make the switch. We view the decision to change auditors as a strategic decision by firm management that represents a publicly available signal about management's expectations since the change is disclosed on SEC Form 8K at the time of the change. An "upstream" change to a larger firm represents a positive signal about the firm's expectations for the future, whereas a "downstream" change to a smaller auditor represents a negative signal that may show up in the form of positive or negative unexpected earnings. A "lateral" change to a similar sized auditor represents a neutral signal.

We use analysts' earnings forecasts as a proxy for the market's expectation about firm prior to earnings release. The difference between the forecast and the subsequent actual earnings amount (unexpected earnings) represents information about the firm that was not incorporated into the analysts' forecast. Analysts' forecasts have been widely used as a proxy for expected earnings in empirical research, and research shows that analysts are motivated to produce accurate forecasts (Mikhail, Walther & Willis, 1999). Therefore, analysts have should rapidly incorporate information about a firm into their forecasts if the information has earnings implications. If analysts fully incorporate the information contained in an auditor switch, systematic differences in unexpected earnings should not exist between firms making upstream and downstream auditor changes.

One problem with using analyst forecasts as a proxy for market expectations is that they are not unbiased on average. Analyst forecasts on average are overly optimistic (Ali, Klein & Rosenfeld, 1992). Analysts may face pressure from the management of firm they analyze to provide "good news" about the firm. Analysts who don't agree to provide "good news" can be cutoff from value relevant information disclosed to analysts before it becomes public knowledge. Given the competitive nature of the financial analysis business the loss of such information is significant, and provides a strong incentive for analysts to keep firm management happy.

Research into analyst forecast bias has found several items that are correlated with forecast bias. Ackert and Athanessakos (1997) found that uncertainty (defined as the standard deviation of analyst forecasts) increases forecast optimism. Analysts seem to have fewer concerns about reputation when making forecasts with high levels of uncertainty and are more likely to "act on their inclinations to issue optimistic forecasts." Lys and Soo (1995) have found that the number of analysts following a firm is negatively correlated with the size of the forecast error. Having a larger analyst following results in more accurate forecasts. Francis and Philbrick (1993) find that analysts are less accurate with earnings forecasts if they have a sell recommendation on the stock. Analysts may be attempting to ameliorate an unfavorable buy/sell recommendation with an optimistic earnings forecast. Mikhail, Walther and Willis (1997) find that a learning effect exists for individual analysts. As analysts gain experience following a specific firm, the more accurate their forecasts become. Forecast accuracy also has an inverse relationship with forecast horizon (Brown, Richardson & Schwager, 1987). The closer the forecast date is to the earnings release date, the more accurate the forecast is. Finally, Dugar and Nathan (1995), and Lin and McNichols (1998) examined the effects of underwriting relationships on sell-side analyst forecast accuracy. They find that analysts are more likely to issue optimistic forecasts for underwriting clients relative to firms they do not have an underwriting relationship with.

HYPOTHESIS DEVELOPMENT

A change in auditor type may provide information to analysts and investors. If this information is not completely understood by market analysts and incorporated into their forecasts, unexpected earnings may be present at the time the company announces its actual earnings. In addition, it is probable that changes to smaller auditor types indicate relevant negative information concerning the company, while changes to a larger auditor type indicated relevant positive information concerning the company. To test the existence of this information and the incorporation of the information into the analysts' forecasts, the following hypotheses (stated in the alternative) are tested:

H1:	Positive unexpected earnings are present at the earnings announcement date when a company has changed from a smaller auditor type to a larger auditor type during the fiscal year
H2:	Negative unexpected earnings are present at the earnings announcement date when a company has changed from a larger auditor type to a smaller auditor type during the fiscal year

SAMPLE SELECTION

Ordinary Least Squares (OLS) regression is estimated with sample firms obtained from the COMPUSTAT industrial tapes, which include firms listed on the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), and the National Association of Security Dealers Automated Quotations (NASDAQ). The sample is selected from the files of the 2000 annual industrial tapes and is limited to firms with earnings information in each year of the period 1989-1999. As a measure of unexpected earnings, we use consensus analysts' forecast, therefore, we require the sample firms to be followed by the Institutional Brokers Estimate System (IBES), similar to Baginski, Hassell and Waymire (1994) and Stunda (1996).

Analysis is limited to firms that have switched auditors during the study period. Following is a breakdown of the number of firms switching auditors by auditor classification:

Type of Switch	Number of Firms
From NB5 to B5	153
From B5 to NB5	43
From B5 to B5	32
From NB5 to NB5	38
Total number of firms	266

METHODOLOGY

The study's sample consists of all publicly traded companies that changed auditor type during the time period 1989 - 1999. In addition, the testing will control for company growth, company size, systematic market risk, and noise.

Big Five versus non-Big Five

An OLS regression model is used to examine whether the unexpected earnings are greater for companies that change auditor type. The following regression will evaluate changes in auditor type classified as Big-Five (B5) and non-Big-Five (NB5) through the assessment of the relative information content of unexpected earnings. The regression model assesses the relative information content of unexpected earnings for firms that change from B5 to NB5 auditors and from NB5 to B5 auditors.

$$UE_{it} = a + b_1 D1_{it} + b_2 D2_{it} + b_3 MB_{it} + b_4 LMV_{it} + b_5 N_{it} + b_6 B_{it} + e_{it}. \tag{1}$$

Where:			
	UE_{it}	=	Unexpected earnings forecast for firm i, time t
	$D1_{it}$	=	Dummy variable, 1 for change from B5 to NB5, 0 otherwise
	$D2_{it}$	=	Dummy variable, 1 for change from NB5 to B5, 0 otherwise
	MB_{it}	=	Market value to book value as a proxy for growth and persistence;
	LMV_{it}	=	Natural log of market value as a proxy for size;
	N_{it}	=	Number of analysts' forecasts included in IBES as a proxy for noise in the pre-announcement environment
	B_{it}	=	Market value slope coefficient as a proxy for systematic risk;
	e_{it}	=	normally distributed error term.

The coefficient "a" measures the intercept. The coefficients b1 and b2 are the earnings response coefficients (ERC) capturing the information content for firms changing respective auditor types. The remaining coefficients are control variables that potentially contribute to the ERC. Each coefficient is assessed for significance in explaining the cross-sectional unexpected earnings change during the study period.

Unexpected earnings (UE_{it}) for each firm are measured as the difference between the actual earnings and security market participants' expectations for earnings proxied by consensus analysts' forecast as per IBES. The unexpected earnings are scaled by the firm's stock price 180 days prior to the forecast:

$$UE_{it} = (\text{Actual Earnings - Expected Earnings}) / \text{Price}$$

Stratification of Firms

The sample of audit firms was next stratified in order to assess whether changes to/from auditor types other then international auditor possessed information content with respect to a change

in the audit firm by the client. Stratification is comprised of four distinct groups. Group one consists of the five largest firms (big- five). These firms averaged more than 2,000 clients as reported on COMPUSTAT for the years 1989-1999. Group two consists of audit firms with an average number of clients between 500 and 2,000 as reported on COMPUSTAT for the years 1989-1999. These firms proxy for national firms. Group three consists of audit firms with an average number of clients between 200 and 500 as reported on COMPUSTAT for the years 1989-1999. These firms proxy for the widespread regional audit firms. Group four consists of audit firms with less than 200 clients as reported on COMPUSTAT for the years 1989-1999. These firms proxy for the localized regional firms. These cut-offs are arbitrary in nature but they are reasonable, based on analysis of the firms contained in the stratification. The following represents the number of audit firms in each category of auditor type evaluated in this study:

Audit Group		# of audit firms
1	(Big Five)	5
2	(Non-Big Five)	6
3	(Large Regional)	16
4	(Small Regional)	10
	Total	37

In order to assess information content for the stratified firms, the following OLS regression model is employed:

$$UE_{it} = a + b_1 D1_{it} + b_2 D2_{it} + b_3 D3_{it} + b_4 D4_{it} + b_5 D5_{it} + b_6 D6_{it} + b_7 D7_{it} + b_8 D8_{it} + b_9 D9_{it}$$
$$+ b_{10} D10_{it} + b_{11} D11_{it} + b_{12} D12_{it} + b_{13} MB_{it} + b_{14} LMV_{it} + b_{15} N_{it} + b_{16} B_{it} + e_{it} \quad (2)$$

Where:
- D1 = Variable for change from group 1 auditors to group 2 auditors
- D2 = Variable for change from group 1 auditors to group 3 auditors
- D3 = Variable for change from group 1 auditors to group 4 auditors
- D4 = Variable for change from group 2 auditors to group 3 auditors
- D5 = Variable for change from group 2 auditors to group 4 auditors
- D6 = Variable for change from group 3 auditors to group 4 auditors
- D7 = Variable for change from group 2 auditors to group 1 auditors
- D8 = Variable for change from group 3 auditors to group 2 auditors
- D9 = Variable for change from group 3 auditors to group 1 auditors
- D10 = Variable for change from group 4 auditors to group 3 auditors
- D11 = Variable for change from group 4 auditors to group 2 auditors
- D12 = Variable for change from group 4 auditors to group 1 auditors
- MB = Variable for market value to book value as a proxy for growth
- LMV = Variable for natural log of market value as a proxy for firm size
- N = Variable for number of analysts' forecasts included in IBES as a proxy for noise in the pre-disclosure environment
- B = Variable for market value slope coefficient as a proxy for risk
- e = Normally distributed error term

All parameters and measures are consistent with the initial regression model of the study.

RESULTS

The following table provides results of including switches from Big Five to non-Big Five and from non-Big Five to Big Five auditors.

Table 1: Summary of Client Firms Switching Auditors						
$UE_{it} = a + b_1 D1_{it} + b_2 D2_{it} + b_3 MB_{it} + b_4 LMV_{it} + b_5 N_{it} + b_6 B_{it} + e_{it}.$						
Variable	Variable Descriptor	Mean	Median	Coefficient	T-statistic	p-value
D1	D from B5 to NB5	-0.2816	-0.2484 [a]	-0.0825	2.8019	0.0120
D2	D from NB5 to B5	0.3041	0.2410 [a]	0.0543	2.4883	0.0201
MB	Growth Proxy	2.2390	1.8761	0.0219	0.3651	0.5102
LMV	Size Proxy	4.3692	4.0077	-0.0329	0.2075	0.7724
N	Noise Proxy	4.7201	4.0000	0.0699	1.0387	0.4009
e	Risk Proxy	1.2971	1.1992	0.0557	0.9921	0.5301

[a] Significant at the .01level using the non-parametric sign rank test
Overall sample = 266 firms
Variable b_1 sample = 43 firms
Variable b_2 sample = 153 firms

Results indicated in Table 1 indicate that positive unexpected earnings are indeed present at the earnings announcement date when a firm changes from a non-Big Five auditor to a Big Five auditor. In addition, negative unexpected earnings are present when a firm changes from a Big Five auditor to a non-Big Five auditor. Using the distribution-free sign rank test, significance is observed at the .01 level.

If the analysts understand the information content of the change in auditor type, the analyst should adjust the earnings forecast to an appropriate level. While analysts would not be accurate 100% of the time, there should be as many errors of overestimation as underestimation. The results suggest that analysts are consistently underestimating the earnings of companies that change from a non-Big Five to a Big Five auditor, and consistently overestimate the earnings for firms that change from a Big Five auditor to a non-Big Five auditor. Auditor change information is either not completely understood by market analysts or market analysts do not fully incorporate the auditor change information, for whatever reasons, into earnings forecasts.

Table 2 provides results from equation 2, the sample of clients switching audit firms by international, national, widespread regional, and localized regional auditor types. The results of Table 2 support the results found in Table 1. Variable D1 represents changes from Big Five audit firms to national audit firms and has a p-value of 0.0357. This indicates that analysts are not adjusting their forecasts when companies change from a Big Five auditor to a national auditor. Variable D2 represents changes from Big Five audit firms to widespread regional audit firms and

has a p-value of 0.0534. This provides weak evidence that analysts are not adjusting their forecasts when companies change from a Big Five auditor to a widespread regional auditor. Variable D3 represents changes from Big Five audit firms to localized regional audit firms and has a p-value of 0.2291. This is no evidence regarding the analysts' adjustment of earnings forecasts when companies change from a Big Five auditor to a localized regional auditor. However, only three companies are in this category and care must be taken on the interpretation of this variable.

Table 2 provides evidence about auditor changes that do not involve Big Five auditors. Variable D4 represents changes from national auditors to widespread regional auditors and has a p-value of 0.3281. This is no evidence regarding the analysts' adjustment of earnings forecasts when companies change from a national auditor to a widespread regional auditor. Variable D5 represents changes from national auditors to localized regional auditors. Unfortunately, no companies that made this switch were identified in our sample. Variable D8 represents changes from a widespread regional audit firm to a national audit firms and has a p-value of 0.0286. This provides evidence that analysts are not adjusting their forecasts when companies change from a widespread regional auditor to a national auditor. Variable D9 represents changes from a localized regional audit firm to a national audit firms and has a p-value of 0.0434. This provides evidence that analysts are not adjusting their forecasts when companies change from a localized regional auditor to a national auditor.

Finally, Table 2 provides evidence about auditor changes to and from widespread regional auditors. Variable D6 represents changes from widespread regional auditors to localized regional auditors and has a p-value of 0.4229. This is no evidence regarding the analysts' adjustment of earnings forecasts when companies change from a widespread regional auditor to a localized regional auditor. Again, only three companies are in this category and care must be taken on the interpretation of this variable. Variable D10 represents changes from localized regional auditor to widespread regional auditors and has a p-value of 0.0656. This provides weak evidence that analysts are not adjusting their forecasts when companies change from a localized regional auditor to a widespread regional auditor.

CONCLUSION

The results of this study indicate that analysts do not fully incorporate information contained in changes in auditor type. Significance at traditional levels is found for companies switching from Big Five audit firms to non-Big Five audit firms. When non-Big Five firms were partitioned significance was found for changes from Big Five audit firms to national audit firms. No statistical significance at traditional levels was found in the clients making other downstream changes. One reason for non-significance in these groups may be due to the small sample size in these change categories.

Conversely, all clients making upstream changes were found to contain positive unexpected earnings at traditional levels of significance for each group in the sample. These results further suggest that financial analysts do not fully incorporate the auditor change information into earnings forecasts, or that auditor change information is not fully understood by these analysts.

| | | Table 2: Summary of Clients Switching Audit Firms by Audit Firm Grouping (n = 231) | | | | |

$$UE_{it} = a + b_1D1_{it} + b_2D2_{it} + b_3D3_{it} + b_4D4_{it} + b_5D5_{it} + b_6D6_{it} + b_7D7_{it} + b_8D8_{it} + b_9D9_{it}$$
$$+ b_{10}D10_{it} + b_{11}D11_{it} + b_{12}D12_{it} + b_{13}MB_{it} + b_{14}LMV_{it} + b_{15}N_{it} + b_{16}B_{it} + e_{it}.$$

Variable	# of Clients [2]	Mean	Median	Coefficient	T-Statistic	p-value
D1	29	-0.1020	-0.1038[a]	-0.07524	2.2693	0.0357
D2	12	-0.1076	-0.1052[a]	-0.08157	2.0591	0.0534
D3	3	-0.1389	-0.1244	-0.99257	1.4855	0.2291
D4	8	-0.1181	-0.1067	-0.06217	1.2569	0.3281
D5	0			n/a	n/a	n/a
D6	3	-0.1409	-0.1380	-0.17881	1.0662	0.4229
D7	91	0.1010	0.0994[a]	0.14278	2.3664	0.0215
D8	11	0.0947	0.0899[a]	0.09667	2.3109	0.0286
D9	55	0.0835	0.0803[a]	0.10471	2.8190	0.0124
D10	6	0.0724	0.0685	0.11893	2.0881	0.0656
D11	9	0.1027	0.1013[a]	0.09288	2.2199	0.0434
D12	4	0.0774	0.0719[a]	0.12187	2.2211	0.0487
MB		2.1895	2.1677	0.03392	0.5846	0.7922
LMV		4.1003	4.1000	-0.03991	0.2934	0.8297
N		3.6741	3.5992	0.06521	1.2988	0.3528
B		1.6095	1.5882	0.02956	1.0880	0.4179

[a] Significant at the .01 level using the non-parametric sign rank test.
[2] Number of switches in the group

This study may provide insight into the currently accepted view of the Efficient Market Hypothesis with respect to the information content of auditor changes and the markets' interpretation of the information. In addition, analysts may need to scrutinize auditor changes more carefully in order to fully understand the signal that may be included in the decisions to step up (or down) in auditor type.

Further research is needed in this area, which may include an analysis of specific industries and any trends that they may possess. Also, since many of the change categories have a small sample size, further research may be conducted expanding the sample period and potential sample. In addition, it is unclear if a trading strategy based on changes in auditor type could yield a portfolio of positive abnormal returns, future studies might be considered to construct sample portfolios based on this strategy.

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BUDGETARY PARTICIPATION AND PERFORMANCE EVALUATION: AN EMPIRICAL STUDY

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ABSTRACT

Continuing trends in healthcare reform require that hospitals constantly seek ways to control costs and effectively use scarce resources. Nursing costs generally represent the largest segment of a hospital's operating budget. Nurse managers are directly responsible for the use and management of healthcare resources and are in a unique position to assist hospitals to achieve cost savings. This study includes questionnaire responses from 109 nurse managers regarding their involvement in the budgeting process at the hospitals where they are employed. The survey results suggest that there is there is substantial opportunity to increase nurse manager involvement in the budgeting process. It is expected that the increased involvement would result in the more effective and efficient use of healthcare resources.

INTRODUCTION

As health care becomes increasingly competitive, the provision of the highest quality of healthcare at the lowest possible cost is a priority. Recent trends in healthcare reform require nurse managers to manage diminishing resources efficiently. Because political as well as competitive pressures have resulted in a reduction of the growth of revenues, cost control is extremely important to the viability of the health care industry.

In this era of managed care, hospitals are constantly seeking ways to control cost and effectively use scarce resources. Nursing represents the largest segment of a hospital's operating budgets, usually comprising over 50% (Caroselli, 1996). Further, nurses are in a position to help achieve cost saving since they are often responsible for the use and management of resources while caring for patients. Unnecessarily long patient hospital stays and wasteful use of supplies and equipment can represent two major sources of rising hospital expenditures (Lutjens, 1993). Inefficient use of supplies and equipment can add more than a million dollars a year to a typical hospital budget (Jeska, 1992). Unjustified expenditures may result in hospital costs not being reimbursed. Therefore, for hospitals to achieve significant savings in these areas, nurses must operate in a cost-conscience atmosphere (Wilburn, 1992). However, nurses often are not provided cost information regarding the services they use and thus lack the information needed to make responsible fiscal decisions. This is unfortunate because efforts to make nurses more cost conscience

have been correlated with decreased lengths of patient stays (Sandella, 1990) and savings with supplies and linen use (Jeska, 1992).

A budget is a "detailed plan for the acquisition and use of financial and other resources over a specified time period" (Garrison & Noreen, 1997). In recent years nurse managers have become increasingly involved in budgetary matters at various levels of health care management. It is not only the nurse manager of a specialty unit that is involved with budget considerations. Departmental directors, supervisors, and directors of nursing are involved as well. This is due in part to the increased use of budgets by management as a tool to assess the accountability of nursing units. Many hospital administrators have come to recognize that superficial involvement in budgetary matters by nurse managers is inadequate to achieve their financial objectives. Nevertheless, some organizations fail to fully utilize the potential contribution of the budgetary process. Therefore, this research project was undertaken to examine the budgetary behaviors of nurse managers in various positions. Studies looking at the role of nurse managers in relation to fiscal management are limited. Most have focused on the nurse manager roles from a more global perspective. Some have focused on the roles and relationships that the manager should maintain with staff, families and other health care professionals to be effective in today's market (Kerfoot, 1994; Musholt, 1996). In most research studies, the focus of the nurses' role was from someone else's perception, such as administration or staff. In a rare qualitative study conducted with nurses, the manager's perception of his/her role was explored (Baxter, 1993). Fiscal management is one role Baxter (1993), as well as others, have identified as essential for any nurse manager (Caroselli, 1996; Kerfoot, 1994). Moreover, it is not only a role that is self-evident but it also an expectation from administrators (Musholt, 1996). Especially relevant is the ability of nurse managers to effectively manage budgets related to employee salaries, which often comprise the largest sector of hospital expenditures.

CONCEPTUAL FRAMEWORK

Mintzberg (1973) identified ten basic roles common to all managers across organizations. The categorization of the ten roles of the manager included interpersonal (those dealing with status and authority), informational (those dealing with interpersonal roles or responsibilities to provide information) and decisional (those that deal with the managers authority). The decisional category includes the role of resource allocator.

The role of resource allocator involves responsibility for the allocation of resources of all kinds. Resources included personnel under the supervision of the manager, equipment that the manager is responsible for maintaining or replacing, and supplies needed to facilitate the daily working of the particular unit. This categorization was used in this study to guide the collection and analysis of data. It provided a basis for describing functions typical of managers, and examining and comparing the functions found in the nurse manager sample.

METHOD

This study is an exploratory survey design. The sample was drawn from a mailing list provided from the Louisiana State Board of Nursing, consisting of 5195 nurses who had

self-identified as nurse managers at the time of licensure renewal. Packets were sent to 575 randomly selected nurse managers. Nine packets were undeliverable. One hundred nine useable surveys were returned for an overall response rate of 19%. There was no follow-up for mailed questionnaires. A self-addressed, stamped envelope with written instructions was provided. The survey packet included survey instruments and a demographic form. Protection of human subjects was assured by following the guidelines of the University Human Subjects Review Board. To be eligible for the study, nurse managers had to 1) be employed by a health care agency, 2) supervise others, 3) be evaluated by someone in an administrative position, and 4) prepare and implement activities requiring budgetary considerations. The sample consisted of 109 nurses between the ages of 27 and 68 (M=43.5, SD=8.4). Gender was representative of the state nurse population; 89.8% female and 10.2% male. The majority of nurse managers were married (72.6%). Most nurse managers were trained in a BSN program (46.3%), followed by diploma (21.3%), associate (19.4%), MS other (6.5%), MS Nursing (5.6%) and other (.9%).

INSTRUMENTS

Nurse budgeting behavior was measured using a revised version of the 23-item Budget-Related Behavior Scale (Carruth, 1979). The original Budget-Related Behavior Scale was developed and tested using managers in industrial firms. Factor analysis with varimax rotation was undertaken to examine the underlying relationships for a large number of variables which yielded three distinct factors; Participation in Budget Preparation; Use of Budgets for Planning and Control, and Manipulation of Accounts.

The revised Budget-Related Behavior Scale-Nurse Managers is a 10-item five-point Likert-type scale that asks nurse managers to what extent they participate in various budget behaviors in their job situation. The instrument is scored 0 to 4 (0 indicating never and 4 indicating always). Ten items were selected by a panel of three expert nurse managers. They were asked to select from the 23 items those items they believed were most relevant to responsibilities of nurse managers. Six items reflect participation in budget preparation, two reflect use of budgets for planning and control, and two reflect manipulation of accounts. Cronbach's alpha was used for estimating internal consistency reliability. The internal consistency of the total 10-item Budget-Related Behavior Scale- Nurse Managers was .92.

To describe the nurse managers' position and to determine management demands, the Nurse Manager Profile was developed. Current position title, years at agency, years in current position, average hours worked each week, and number of people supervised were recorded in an open-ended format. Position was collapsed to 5 categories because over 20 different names/titles were reported. In the first two categories, position was coded based on number of people supervised and the extent to which types of patient services were managed. Subjects describing responsibilities as concentrated on one unit or one type of service or supervising less than 10 employees was coded as a "unit-based manager/coordinator". When subjects indicated they were responsible for more than one unit or were in charge of an entire department/division supervising more than 10 employees, they were coded as Departmental/Divisional Director". The last three categories were coded: Nursing supervisors; Assistant Director of Nursing; or Director of Nursing (DON). Type of salary

was recorded as fixed or hourly. Type of patient care services under nurse managers' supervision, were measured by asking nurse managers to select all that apply from 21 categories. Number of supervised patient care services was calculated by summing the number of categories selected.

To determine the extent participation in budgetary activities were used in their evaluation, a single item was asked: My superior questions budget reports, and uses them carefully in my evaluation. This item is scored 1 (strongly disagree) to 5 (strongly agree).

Demographic data, including age, gender, marital status, and educational level were determined. Age was recorded as age in years. Gender was measured by subject self-report. Marital status was assessed by subject self-rating as single, married, divorced, separated, widowed or living with significant other. Education was measured by seven categories ranging from diploma degree to graduate professional training.

RESULTS AND IMPLICATIONS

Table 1 summarizes responses for each item on the Budget-Related Behavior-Nurse Manager Scale. For ease of comparison, responses were collapsed to Always/Often, Occasionally, and Seldom/Never. Less than 60% of the nurse managers Always/Often participate in preparing future budgets and have their suggestions included in the budget. Although 65.7% of the nurse managers believe that their supervisor listens to them regarding budget matters, less than 23% have the authority to approve the final budget. Surprisingly, less than 50% of the nurse managers Always/Often use budgets to plan activities and only a slightly higher percent investigate budget variances. Further, less than 42% of the nurse managers prepare a written explanation of what caused the variances. Less than 16% of the nurse managers Always/Often shift figures to reduce variances or stop activities when budgeted funds are depleted. Finally less than 33% Always/Often take corrective action for the budget.

These results indicate that nurse managers are not as involved in the budgeting process as they could be. Ideally, budgets should be used for planning and control purposes. Financial and/or operational goals should be established. Results should be measured on a regular basis and compared to the expectations which are quantified in the form of a budget. Any material variances between actual and expected results should be investigated. If possible, corrective action should be taken to avoid or reduce future variances. If no corrective action is possible, then the budget should usually be adjusted to reflect reality (Garrison & Noreen, 1997; Horngren, Datar & Foster, 2003).

Realistic budgets are usually based on input received from employees at several different levels of the organization. For example, line-personnel are frequently aware of issues that can have a direct effect on the quantity of resources, such as the labor hours and supplies, necessary for them to do their job. Upper level personnel will typically be more aware of the financial cost of acquiring the labor, materials, and equipment necessary to accomplish the goals. Getting input from the people affected by the budget helps ensure that unrealistic assumptions and other budgeting mistakes are avoided. Also, when employees are expected to participate in the budgeting process, they are more likely to feel a sense of commitment to meet goals that they either set for themselves or which they believe are reasonable. If a budget is realistic it can help motivate employees to perform at a high level. Most people generally work better and faster when they know what is expected of them and

that they will be evaluated based on their performance. Another important concept is that of responsibility accounting. Employees should be evaluated based on the results of activities which are under their control. If they do not have the authority to take action, they should not be held responsible for the results (Garrison & Noreen, 1997; Horngren, Datar & Foster, 2003).

Based on the budgeting principles described above, nurse managers should be given a larger role in preparing budgets, measuring results, investigating variances, and taking corrective action. For example, lower level nurse managers should be involved in determining the nurse-hours and the quantity of supplies necessary for their units to perform effectively and efficiently. Also, nurses typically record the supplies used by each patient on the patient's chart. This information is used when the patient bills are prepared. The nurse managers should make sure that charges are being properly recorded and that there is a high correlation between the total supplies used and the total supplies billed to the patients within their unit.

Higher level nurse managers should be involved in allocating resources between departments or units and determining overall staffing and compensation levels. They should also have responsibility for controlling the quantity of supplies maintained and used by the departments. The purchasing department should usually be responsible for controlling the per unit cost of the supplies acquired. The higher level nurse managers should also be responsible for meeting revenue projections such as the nursing and supplies charges billed per patient admitted.

Table 1			
Budget Activities of Nurse Managers	Always/Often	Occasionally	Seldom/Never
	%	%	%
I participate in preparing future budgets.	58.7	23.9	17.4
Budgets include suggested changes.	53.7	29.6	16.7
My supervisor listens to budget matters.	65.7	19.4	14.9
Budgets are not finalized until I am satisfied with it.	22.2	13.9	63.9
Budgets are used to plan activities	48.2	25.9	25.9
I investigate budget variances.	52.8	15.7	31.5
Explanation in writing about causes.	41.7	16.6	41.7
I shift figures to reduce variances.	14.9	27.2	57.9
Stop some activities when budgeted funds are depleted.	15.7	38.9	45.4
Corrective action for budget.	32.4	28.7	38.9

Both lower and higher level nurse managers should be responsible for investigating material budget variances. They should document their findings and conclusions. When possible, a corrective plan of action should be prepared and executed. If no corrective action is possible, then the budget should be adjusted.

Table 2 profiles nurse managers based on position. The average age of the nurse managers included in the sample was between 40 and 48.2 years old and increased with the level of responsibility held. Fifty percent or more of the unit-based coordinators, departmental/divisional directors, and directors of nursing had a B.S. or higher level of education. All positions, other than the assistant director of nursing, had an average of at least 5 years experience at that position. Other than house supervisors, the number of employees supervised by nurse managers increased as the nurse manager's level of responsibility increased. The hours worked by the lower-level nurse managers were on average higher than the number of hours worked by upper-level nurse managers. The average nurse manager is mature, educated, and has held more than one position in the field of nursing. It would appear that nurse managers would be capable of taking a greater role in the budgeting process for their areas.

Table 2					
Profile of Nurse Managers Based on Position					
	Unit-based Coordinator	Departmental/ Divisional Director	House Supervisor	Assist. DON	DON
	N=34	N=40	N=13	N=7	N=15
Average Age (years)	40.0	43.6	45.6	46.1	48.2
Education (% BS or Higher)	50.0	71.8	38.4	28.6	73.3
Average Years in Position	5.6	6.7	5.5	3.1	5.8
Average Number Supervise	16.6	38.3	22.1	60.4	63.8
Average Hours/Week	47.7	49.3	38.4	44.6	44.6

Table 3 reports whether the nurse managers disagree or agree with the statement that their supervisor questions budget reports and uses them as part of their performance evaluation process. Although the majority of the unit-based coordinators, departmental/divisional directors, and house supervisors agreed that budget variances were considered as part of their performance evaluation process, a large percentage of each group disagreed. This finding is consistent with the results reported in Table 1. In contrast, the majority of the assistant directors of nursing and the directors of nursing disagreed with the statement. This result was not expected. Usually, the higher the level of responsibility, the more important it is to meet budgets.

Table 3		
Performance Evaluation Based on Nurse Manager Position: Supervisor Questions Budget Reports And Uses in Evaluation		
Position	Disagree (%)	Agree (%)
Unit-based Coordinator	39.4	60.6
Department/Division Manager	35.0	65.0
House Supervisors	46.2	53.8
Assistant DON	71.4	28.6
DON	56.3	43.7

SUMMARY

Continuing trends in healthcare reform require that hospitals constantly seek ways to control costs and effectively use scarce resources. Nursing costs generally represent the largest segment of a hospital's operating budget. Nurse managers are directly responsible for the use and management of healthcare resources and are in a unique position to assist hospitals to achieve cost savings. This study includes questionnaire responses from 109 nurse managers regarding their involvement in the budgeting process at the hospitals where they are employed. The results of this study indicate that less than 60% of responding nurse managers actively participate in the budgetary process, including the preparation of unit budgets and the investigation of budget variances. An even lower percentage takes corrective action. The survey results suggest that there is there is substantial opportunity to increase nurse manager involvement in the budgeting process. It is expected that the increased involvement would result in the more effective and efficient use of healthcare resources.

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THE LISTING BROKER PHENOMENON: DOES THE LISTING BROKER IMPACT THE PERCENTAGE OF ASKING PRICE REALIZED IN A RESIDENTIAL SALE?

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ABSTRACT

Is the selling price affected if the listing broker in a real estate transaction is also the selling broker? Does a property sell faster if the listing broker is also the selling broker? If in fact there are effects because of the dual presence of the broker in a transaction, what are they? In this paper we attempt to address these questions.

INTRODUCTION

There are many factors which influence both the length of time required to sell a piece of residential property and the final selling price of the property. The location and the physical attributes such as size, age, number of rooms, condition of the house, and other such items have an obvious impact on the value of the property. The time required to sell the property depends on these items as well as the listing price of the property. However, other factors such as the general economic conditions of the area and the level of mortgage interest rates may influence the number of days the property will remain on the market and the final selling price.

Here we address the issue of the real estate broker in the real estate transaction process. In some sales, the broker listing the property for sale is also the broker making the final sale. In other sales, the listing and selling brokers are different. Does this make a difference in the selling price and the time the property is on the market? Based on eighteen years of real estate data, some interesting results are found.

Literature Review

Knight (2002) reports the results of a study that show the price change effect on the sales of houses. Using the maximum likelihood probit model, he finds houses undergo price changes most frequently when the markups are high. Those houses with unusual features are least likely to undergo price changes from list. This study suggests that mispricing a home in the initial listing can

be very costly to the seller in terms of both time and money. If large price changes do occur the houses take longer to sell and tend to sell at lower prices.

Yavas, Miceli, and Sirmans (2001) did an analysis of bargaining between the buyers and sellers and their relationship to an intermediary (broker). The results show that intermediaries increase the selling price and increase the time it takes to reach an agreement. Their study concludes that the major benefit of a broker may lie predominantly in the matching of buyers and sellers and not in the facilitating of bargaining.

Rutherford, Springer, Yavas (2001) did an analysis comparing the use of an exclusive agency listing and an exclusive right to sell listing in real estate transactions involving a broker. Their study concluded that while both types of contracts yield the same price in a transaction, the exclusive agency contract resulted in a faster sale (or lower number of days on market). The faster sale is typically accomplished at the cost of accepting a lower price. An exclusive agency contract is correlated with more price concession during negotiation.

Elder, Zumpano, and Baryla (2000) examine the role of a buyer broker (a broker who is paid by the buyer rather than the seller for services rendered) in the home buying process. They looked at the effects of the presence of buyer brokers and the selling price and number of days the property remained on the market. They conclude that with a buyer broker there is no price effect but a reduction in the buyer search time compared to for-sale-by-owner (FSBO) transactions. They conclude buyer brokers are more effective in reducing search times for their clients than the more traditional seller agents or other types of arrangements.

Other studies have shown that there are several factors impacting housing prices and the time required to sell the property. In 1996, Caples, Hanna, and Smith studied the effects of employment and interest rates on housing prices. They concluded that changes in housing prices typically lag behind changes in employment. Also, changes in interest rates impact housing prices but to a lesser degree.

The Study

In this paper we investigate two variables. The first is the time that it takes to sell the property once it is listed. This is typically called the number of days on the market (DOM). The second variable is the actual selling price of the property relative to the listing price. This ratio is calculated by dividing the actual selling price by the listing price to determine the proportion of the listing price that is realized in the sale. We determine if an agency problem exists relative to these two variables.

An agency relationship exists when one person (the principal) hires someone else (the agent) to act on his or her behalf (i.e. to sell a piece of property). An agency in real estate is created by contract. In most cases, the contract is between the agent (the listing broker) and the seller of the property. The agent is obligated to act in the best interest of the principal (the seller). However, it is possible that the agent may at times better himself at the expense of the principal, thereby not acting in the best interest of the principal. Advising the seller to accept an offer of a lower price in order to expedite the sale is an example of this. This is sometimes referred to as the agency problem.

In this paper we investigate whether an agency problem does exist relative to the selling price in residential real estate transactions. We also consider whether there is an agency impact relative to the number of days that the property stays on the market.

One possible result could be that the ratio of the selling price to the asking price is higher in cases where the listing broker is also the selling broker, versus the case where one broker lists the property and another agency actually sells the property. There could be numerous explanations for this particular result. For example, the listing broker (and the agents who work under his/her supervision) could be more familiar with the piece of property and therefore be better able to market it. At the same time, agents of other brokers view this property as one of many on the market and have no specific motivation to promote it more than any other property. The listing brokers and agents then may have additional motivation to push clients to come in with a higher selling price.

Another factor to be considered is the commission that will be received by the listing broker. This is based on a percentage of the selling price of the property. Therefore, the broker may get a higher marginal gain if she encourages a higher price to be paid for the property.

The listing broker is a representative of the seller and this fact is obvious. While the selling broker is also a representative of the seller in almost all cases, it may be less obvious to the general public. It is therefore more likely that the buyer will identify more closely with the selling broker. Some people believe there is collusion between the seller and the selling broker to get a higher selling price at the expense of the buyer. While this may not be true (it probably is usually untrue) many people still believe it to be so.

On the other hand, there is also motivation for the listing broker to encourage a quick sale. One way to do this is to encourage potential buyers to offer less than the listing price, and to encourage the seller to accept this offer. This will affect a quick sell and generate a commission and at the same time insure the listing broker gets the entire commission and doesn't have to split it with anyone else.

THE STUDY

Data were gathered from the multiple listing service for the first quarter of each year from 1979 to 1996. This included approximately 3,000 sales during this period of time. The housing data were from sales in a medium size city (150,000 population in the SMSA) in the south as reported by the multiple listing service.

We divided the data into two groups. The first group consisted of sales where the listing broker was also the selling broker. The second group consisted of sales where the listing broker and selling broker were not the same. Table 1 gives the mean results for days on market for each group (i.e. same broker and different brokers). All eighteen years of the study are shown in Table 1.

Table 1				
	Mean Days on Market		Median Days on Market	
Year	Group 1: Listing Broker and Selling Broker are Same	Group 2: Listing Broker and Selling Broker Not Same	Group 1: Listing Broker and Selling Broker are Same	Group 2: Listing Broker and Selling Broker Not Same
1979	50.16	52.95	36.00	41.50
1980	49.97	64.05	36.00	43.00
1981	47.68	55.50	43.00	55.50
1982	73.70	69.59	57.00	60.50
1983	67.96	108.13	49.50	101.00
1984	86.90	110.10	66.00	92.00
1985	80.15	119.60	60.00	81.00
1986	104.30	142.50	104.30	142.50
1987	100.60	142.90	62.00	94.50
1988	121.90	100.10	71.00	68.00
1989	84.50	126.50	52.00	89.50
1990	139.70	134.60	46.50	88.00
1991	111.70	142.80	81.00	108.50
1992	127.50	137.70	69.00	95.00
1993	100.70	150.70	58.00	87.00
1994	84.10	102.70	23.00	58.50
1995	109.30	90.55	86.00	65.00
1996	65.16	90.14	51.00	68.50

For group 1 properties, the average time on the market was less time than properties in group 2 except in 1988, 1990, and 1995. When we investigated these years, we found the number of sales to be very high in these years.

In some years the average time on the market was very high due to the fact that some properties that had been on the market for several years finally sold. For this reason, the median is a better indicator of the typical days on the market than the mean. Note that the mean in group 1 is higher than the mean in group 2 in 1988, but the median for group 1 is almost the same as the median in group 2. In 1990 while the mean in group 1 is higher than the mean in group 2, the median in group 1 is below the median in group 2. This would indicate some extreme values existed in those years. When comparing the two groups using the median, group 1 properties were on the market for less time than properties in group 2 except in 1988 and 1995. In most years, the median differences in DOM were quite large.

Table 2 provides data on the selling price as a proportion of the listing price. The mean for the group 1 proportion is lower than the mean proportion for group 2 in 15 of the 18 years. The only years where this is not true are 1981, 1984, and 1996. It is possible that outliers existed in these years due to the economic conditions of the time. When the median proportions are considered, the results are mixed. In 11 of the 18 years, group 1 median proportions were lower, while in 7 of the 18 years they were higher.

Table 2				
	Mean Selling as % of Asking		Median Selling as % of Asking	
Year	Group 1: Listing Broker and Selling Broker are Same	Group 2: Listing Broker and Selling Broker Not Same	Group 1: Listing Broker and Selling Broker are Same	Group 2: Listing Broker and Selling Broker Not Same
1979	0.9684	0.9758	0.9758	0.9953
1980	0.9537	0.9706	0.9537	0.9706
1981	0.9723	0.9545	0.9836	0.9717
1982	0.9429	0.9516	0.9677	0.9600
1983	0.9204	0.9539	0.9435	0.9576
1984	0.9405	0.9347	0.9512	0.9559
1985	0.9120	0.9465	0.9383	0.9559
1986	0.9188	0.9289	0.9338	0.9425
1987	0.9133	0.9208	0.9370	0.9321
1988	0.9047	0.9343	0.9307	0.9381
1989	0.9102	0.9339	0.9462	0.9427
1990	0.9050	0.9246	0.9308	0.9446
1991	0.9097	0.9379	0.9446	0.9528
1992	0.9105	0.9460	0.9350	0.9543
1993	0.9320	0.9446	0.9649	0.9511
1994	0.9346	0.9489	0.9642	0.9555
1995	0.9340	0.9551	0.9507	0.9703
1996	0.9579	0.9498	0.9725	0.9682

SUMMARY AND CONCLUSIONS

In this study, the number of days required to sell a house was typically lower when the listing broker and the selling broker were the same. While there were exceptions, this was the trend. There was no clear trend in observing the selling price as a proportion of the asking price. There were

occasions where group 1 was lower, and this would be consistent with obtaining a quicker sale. Other years had different results. The differences in many of the years were quite small, indicating that whether the listing and selling broker are the same or not made little difference in the final selling price.

There are obviously many factors influencing the days on the market and the selling price of a house. To get a true picture of these, many other variables should be included in any model that describes this.

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DO REVISED RECOMMENDATIONS HAVE INVESTMENT VALUE IN THE MALAYSIAN STOCK MARKET?

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ABSTRACT

This paper examines the value of the revisions of stock recommendations made by brokerage analysts during pre-financial crisis and financial crisis over March 1996 to August 1998 in the Malaysian stock market. The results show that only the new sell recommendation made by the brokerage analysts provides economic value to investors. It is interesting to note that the value of the revisions of stock recommendations appears linked to the performance of the stock market. The new sell recommendation during pre-financial crisis and financial crisis periods indicates largely negative and significant abnormal returns. The results reflect the view that Malaysian investors "buy on the rumors", however, "sell on the facts". In addition, the results of recommendation changes to the stocks with control for the firm size and volume traded appeared to indicate minimal impact on the abnormal returns. It is suggested that analysts to make recommendation changes and release the information much earlier in order outperform their benchmarks.

INTRODUCTION

Information on brokerage analysts' stock recommendation provides investment value in view of the possibility of the analysts having access to private information. How far can investors experience superior returns in investment based on analysts' stock recommendations as well as their revised recommendations? Do revised recommendations have value as well? Hence, this paper aims to investigate the performance of the recommendation changes--the new buy, new hold, and new sell recommendations--in the Malaysian stock market, one of the eminent market forces in Southeast Asia that experienced financial crisis in 1997 and 1998 that drew global attention and debate. The vulnerability and slump in the Malaysian stock market had cracked the rice bowl of research analysts due to high expense of retaining them.

This paper contributes further evidence of stock price responses to upgraded or downgraded recommendations of stocks in an emerging market which has different investment practices as compared to developed stock markets. This paper also adds evidence to the values of the revised recommendation during pre-financial crisis and financial crisis periods.

Section two presents a review of previous empirical research in this area. Then, section three focuses on a discussion of the data and the methodology to be employed in this study. The results

of the study are presented and discussed in section four. Finally, the conclusion of this study is presented in section five.

LITERATURE REVIEW

The investment community has perceived brokerage analysts as experts possessing specialized analytical skills, knowledge, and access to private information. The recommendation changes on stocks made by them may provide valuable information to investors in making their investment decisions.

Lloyd-Davies and Canes (1978) indicated that recommended stock made by an analyst in the 'Heard on the Street' HOTS column in the Wall Street Journal brought abnormal returns and advocated the economic value of the advice by the analyst. Liu, Smith, and Syed (1990) reexamined the security recommendation on the Wall Street Journal from 1st September 1982 to 30th September 1985 on whether the recommendations had an impact on the stock prices. The results showed that the HOTS column have an impact two days prior to the publication and on the publication day itself. The above average returns appeared to be associated with the trading volume of the stock while the impact of buy and sell recommendations appeared to be symmetric. The results are consistent with the study by Lloyd-Davies and Canes (1978).

Givoly and Lakonishok (1979), Groth, Lewellen, Schlarbaum, and Lease (1979), and Bjerring, Lakonishok, and Vermaelen (1983) indicated that investors who followed the stock recommendations made by stockbroking firms would be able to achieve above average returns.

Womack (1996) evaluated investment value of the recommended stocks made by 14 major stockbroking firms in United States. He focused on the market reactions to new sell recommendations and withdrawals of buy and sell recommendations. He indicated that means of the post-recommendation event for buy recommendations are short-lived; with means of 2.4%. However, the drift was somewhat larger for sell recommendations with means of -9.1% and prolonged for the next six months. He concluded that the investment analysts in the 14 brokerage firms had demonstrated market timing and stock picking abilities.

Khanthavit (1999) examined the value of stock recommendations in the Thailand stock market from 7th March 1994 to 3rd March 1997. The results revealed positive abnormal returns on recommended stocks on Monday and Tuesday in the recommendation week but not on the subsequent days. The study suggested that investors would have benefited if the recommendation was made earlier. A short period of investment was recommended. The results suggest that the investment analysts have poor stock selection and market timing abilities. These results were inconsistent with the findings of Womack (1996) that examined the analysts from the United States.

Ryan and Taffler (2000) investigated the economic value of the analysts' recommendation made by six leading London-based brokerage houses in the United Kingdom market. They focused on the stock recommendation changes form January 1994 to June 1995. The results reveal that revisions of the stock recommendations have an impact on the stock price on both the revised recommendation period as well as the subsequent months. Factors like firm size and incentives practice have influenced the returns made.

Sarkar and Jordan (2000) examined the stock price reactions to the stocks recommendations in the regional Wall Street Journal from September 8, 1993 to December 31, 1996. The results indicated that the positive and significant above average returns happened only on the publication day.

DATA AND METHOD

This paper examines the value of the revisions of stock recommendations on the Malaysian stocks from March 1996 to August 1998 in the publication of 'Malaysia Monthly' by a foreign brokerage house. The publication is obtained from its associate brokerage firm in Malaysia. The stock prices are obtained from the Thomson Financial Datastream database.

The sample is further divided into pre-financial crisis (March 1996 - June 1997) and financial crisis (July 1997 - August 1998) periods. It should be noted that with immediate effect 1st September 1998, the Malaysian government introduced capital control measures to curb the financial crisis. The Malaysian Ringgit is no longer legal tender outside Malaysia. The Malaysian Ringgit is pegged against the United States Dollar at the rate of US\$1.00 = RM3.80.

The standard market model is employed to compute abnormal returns. The abnormal returns for stock j on event month, t, AR_{jt} is computed as follows:

$$AR_{jt} = R_{jt} - (Intercept_j + Beta\ Coefficient_j\ R_{mt}) \hspace{3cm} Formula\ (1)$$
where:
R_{jt} = The return on security j for month t;
R_{mt} = The return on the market index for month t; and
$Intercept_j$ and $Beta\ Coefficient_j$ = The ordinary least squares estimated for firm j's market model parameters

The market model is estimated over 48 months beginning t = -54 through t = -7 where t = 0 is the release month of the recommendation changes. The market index used is the Kuala Lumpur Stock Exchange Composite Index.

For a sample of N stocks, the average abnormal returns (AR) and t-statistic for the abnormal returns for month t are computed as follows:

$$AR_t = (1/N)\ Sum(AR_{jt}) \hspace{4cm} Formula\ (2)$$
where:
j = 1,...,N
t = -6,...,+6

$$AR\ (t\text{-}statistic) = AR_t\ (n_t)^{1/2}\ /Sd_t \hspace{3cm} Formula\ (3)$$
where:
AR_t = the average monthly abnormal return;
n_t = number of observation in month t; and
Sd_t = the cross-sectional standard deviation of the adjusted returns for month t.

The t-statistics for the cumulative average adjusted return (CAR) in month t, is computed as follows:

CAR (t-statistic) = $CAR_{j,t} (n_t)^{1/2} / CSd_t$ *Formula (4)*

where:
n_t = number of firms in each month;
t = event month;
$CSd_t = [t(var) + 2(t-1)COV]^{1/2}$;
var = average (over 13 months) cross section variance; and
COV = The first order auto covariance of the AR_t series.

Apart from the two sub-sample periods, this study also investigates the impact of firm size and volume traded on the stock prices with the revised recommendations. The control for firm size is done through ranking the firm size of the stocks based on the market value of the stocks on the publication month (event month). Then, the sample is divided into approximate thirds, and the event study methodology described above is then applied to each third.

The control for volume traded is done through ranking the stocks by its volume ratio. The volume ratio is obtained by dividing event day volume with previous 6-day average volume. The sample is sorted into 1/3, and the event study methodology described is applied to each third.

To gauge further insights during the pre-financial crisis and financial crisis periods, we had also re-examined the random walk movement of the Kuala Lumpur Stock Exchange Composite Index (KLSE CI), the main and most popular market barometer for the Malaysian stock market. The random walk was examined by using the variance ratio test proposed by Lo and MacKinlay (1988).

The variance ratio test is motivated by the notion that if the underlying data generating process for stock returns is serially random with constant variance, the variance ratio at lag q will be unity under the random walk hypothesis when the ratio of the variance of the q-period return to the variance of the one-period return divided by q.   The null hypothesis is stated as follows:

Ho: The variance ratio at lag q, VR(q) equals to unity (one) when the ratio of the variance of the q-period return to the variance of the one-period return divided by q

If the variance ratio, VR(q) equals to one, it implies the returns follow random walk. Otherwise, the random walk hypothesis will be rejected. In addition, if the values of VR(q) are less than one with the increased of lag q, they imply the mean reversion behavior of the returns. Alternatively, if the values obtained are greater than one with the increased of lag q, thus imply mean aversion behavior of returns.

Lo and MacKinlay (1988) stated that in a finite sample the increments in the variance are linear in the observation interval for a random walk. The variance of its qth-differences is q times the variance of its first difference for a random walk series. In other words, if the logarithms of the stock prices are generated by a random walk, the variance of the returns should be proportional to the individual sample interval. Thus, as noted by Lo and MacKinlay (1988), the variance of the

monthly price changes must be four times the variance of weekly price changes. Chow and Denning (1993) further emphasized that the variance ratio test required a sample size of at least 256 observations to have reasonable power against other alternative tools.

To explain the variance ratio test, let P_t denote the stock price at time t and X_t represents the natural logarithm of stock price, P_t . Under random walk model:

$X_t = Mean + X_{t-1} + Error\ term_t$ *Formula (5)*
or $R_t = Mean + Error\ term_t$

where $R_{t=}X_t - X_{t-1}$ (so R_t is stock return). The variance ratio of q grows linearly with the lag of q. That is, the variance of $X_t - X_{t-2}$ would be twice the variance of $X_t - X_{t-1}$.

To calculate variance ratios, we obtain *nq+1* observations, $X_0, X_1, X_2, X_3, ...X_{nq}$ at equally spaced intervals, where q is any integer greater than 1 and *nq* is the number of observations of X_t. The variance ratio is defined as follows:

$VR(q) = variance_c(q) / variance_a(q)$ *Formula (6)*

where:
variance$_c$(q) = an unbiased estimator of 1/q of the variance of the qth difference of X_t
variance$_a$(q) = an unbiased estimator of the variance of the first difference of X_t

The estimates of an unbiased variance for a single period variance$_c$*(q)* and variance$_a$*(q)* are calculated as follows:

$Variance_c(q) = (1/m)\ Sum[X_t - X_{t-q} - q(predicted\ mean)]^2$ *Formula (7)*

where: $t = q,...,nq$
               $m = q(nq - q + 1)[1 - (q/nq)]$

$Variance_a(q) = [1/(nq-1)]\ Sum(X_t - X_{t-1} - predicted\ mean)^2$ *Formula (8)*

where: $t = 1,...,nq$
               $predicted\ mean = 1(X_{nq} - X_0)/nq$

After deriving an asymptotic distribution of the variance ratios, VR(q), homoscedasticity test statistic, Z(q) and heteroscedasticity-robust test statistic, Z*(q) are computed to test the null hypothesis for different specifications of the error terms behavior. It is worth noting that the variance ratio test has been widely used in the literature as it is more appealing compared to other traditional tests of random walk which has been indicated by Ayadi and Pyun (1994).

ANALYSIS AND DISCUSSION

A total of 228 recommended stocks had been changed during the studied period, with the new hold recommendation making up 42.54% of the recommended change. A total of 73 new buy recommendations and 58 new sell recommendations reports a ratio of 1.26:1. Investment analysts seemed less likely to issue sell recommendations. This study revealed that only 18 out of 58 new sell recommendation changes were previously buy recommendation, representing 31.03%. The 68.97% of the new sell recommendation were changed from the hold recommendation.

Table 1 presents the results of the new buy recommendations of 73 companies over the period of March 1996 to August 1998. The results of Table 1 indicate that the publication of the 'Malaysia monthly' has statistically less significant impact on the stock prices with the monthly abnormal returns (AR) of 0.66% and cumulative abnormal returns (CARs) of 1.47%. However, following the release of the revised recommendation, the AR and CARs subsequently fell. This may imply a leakage of information before the stocks subjected to recommendation changes were made. The abnormal returns for the new buy recommendation did not continue after the recommended changes. This finding is consistent with studies by Groth et al. (1979) and Bjerring, Lakonishok and Vermaelen (1983). The magnitude of the abnormal returns is somewhat lower in which Womack (1996) and Elton, Gruber, and Grossman (1986) who found 3% and 1.9% of abnormal returns, respectively.

Table 1: Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) around Recommendations Changes from March 1996 to August 1998							
Panel A: New Buy Recommendations							
Month	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)	CARs (0,1)	CARs (t-statistic)	CARs (2,6)	CARs (t-statistic)
-6	0.89	0.77	0.89	0.56				
-5	0.39	0.29	1.28	0.62				
-4	0.07	0.08	1.36	0.47				
-3	1.35	1.33	2.70	0.86				
-2	-1.89	-1.58	0.82	0.23				
-1	-0.01	-0.00	0.81	0.19				
0	0.66	0.36	1.47	0.35	0.66	0.36		
1	-2.78	-1.21	-1.31	-0.39	-2.12*	-1.02		
2	-4.32	-2.50*	-5.63	-1.74			-4.32	-2.38*
3	1.05	0.53	-4.58	-1.04			-3.27	-1.34
4	0.20	0.10	-4.38	-2.19*			-3.07	-1.36
5	-3.80	-2.22*	-8.18	-3.39**			-6.87	-2.71**
6	-0.03	-0.02	-8.20	-1.31			-6.89	-1.60

Table 1: Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) around Recommendations Changes from March 1996 to August 1998								
Panel B: Breakdown of New Buy Recommendation Changes								
	From Hold to Buy				From Sell to Buy			
Month	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)
-6	0.42	0.32	0.42	0.25	3.88	2.19	3.88	0.72
-5	0.75	0.50	1.17	0.57	-1.89	-0.71	1.99	0.25
-4	0.67	0.68	1.84	0.64	-3.69	-1.20	-1.70	-0.17
-3	0.93	0.88	2.77	0.88	3.99	1.20	2.29	0.19
-2	-1.65	-1.28	1.12	0.30	-3.36	-1.04	-1.08	-0.10
-1	0.33	0.25	1.45	0.33	-2.12	-0.49	-3.20	-0.21
0	1.98	1.29	3.43	0.90	-7.68	-0.84	-10.88	-0.62
1	-4.26	-1.74	-0.83	-0.17	6.57	1.05	-4.31	na
2	-2.97	-1.61	-3.81	-1.07	-12.78	-3.06*	-17.09	-1.25
3	2.07	1.11	-1.74	-0.51	-5.40	-0.63	-22.49	-1.07
4	-1.02	-0.50	-2.76	-0.63	7.91	1.14	-14.58	na
5	-3.18	-1.71	-5.94	-1.96	-7.69	-1.78	-22.27	-6.23**
6	0.81	0.53	-5.13	-0.77	-5.34	-0.83	-27.60	-1.64
Notes: * denotes p < 0.05, ** denotes p < 0.01 na = not applicable								

Table 2 shows the AR and CARs of the new sell recommendation. We documented -5.56% abnormal returns in the announcement month. The brokerage analysts demonstrated good revised sell recommendation abilities. The performance of stocks after the release period indicated significantly large and negative CARs. The magnitude abnormal returns in the event month was the greatest among the 13 months studied. On the other hand, there is also an evidence of statistically large negative significant returns prior to the recommended change. This may suggest that the brokerage analysts should have made the revised recommendation much earlier.

The results of the new hold recommendation show no statistically significance for the abnormal returns and cumulative abnormal returns generated. The AR and CARs of the new hold recommendations are negative in general. The result is consistent with studies by Elton, Gruber and Grossman (1986) and Womack (1996).

The overall findings revealed that the brokerage analysts studied demonstrated good stock picking abilities in making only sell recommendation revision.   This may be associated with the downturn of the stock market performance during the studied period. Nevertheless, when it comes to the new buy or hold recommendation, this recommendation revision made by the brokerage firm seemed most disappointing and undesirable. Prices responses to upgrades are less pronounced than the downgrades.   In general, the brokerage analysts provide no investment value in new buy and

hold recommendations. Thus, it is suggested that investors only resort to the new sell recommendations before making the financial decisions.

Table 2: Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) around Recommendations Changes from March 1996 to August 1998							
Panel A: New Sell Recommendations							
Month	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)	CARs (0,1)	CARs (t-statistic)	CARs (2,6)	CARs (t-statistic)
-6	-2.96	-1.73	-2.96	-1.24				
-5	-1.96	-0.92	-4.92	-1.66				
-4	-4.83	-2.17*	-9.75	-2.11*				
-3	-3.92	-1.42	-13.66	-2.74**				
-2	4.81	1.83	-8.86	-4.40**				
-1	-4.69	-2.52*	-13.54	-2.08*				
0	-5.56	-2.80**	-19.10	-2.63*	-5.56	-2.80**		
1	-4.78	-2.49*	-23.89	-3.16**	-10.34	-5.29**		
2	-0.10	-0.03	-23.99	-3.92**			-0.10	-0.04
3	0.81	0.27	-23.18	-5.10**			0.71	0.22
4	1.11	0.48	-22.07	-3.20**			1.82	0.42
5	3.51	1.32	-18.56	-2.30*			5.33	1.01
6	-3.23	-1.46	-21.79	-2.22*			2.09	0.32
Panel B: Breakdown of New Sell Recommendation Changes							
	From Hold to Sell				From Buy to Sell			
Month	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)
-6	-3.34	-1.65	-3.34	-1.21	-2.10	-0.65	-2.10	-0.45
-5	-1.96	-0.79	-5.31	-1.42	-1.94	-0.46	-4.05	-0.87
-4	-6.85	-2.27*	-12.15	-2.31*	-0.35	-0.15	-4.39	-0.48
-3	-4.46	-1.44	-16.61	-3.14**	-2.72	-0.47	-7.11	-0.66
-2	6.10	2.29*	-10.52	-2.28*	1.94	0.32	-5.16	na
-1	-5.24	-2.18*	-15.76	-1.95	-3.45	-1.23	-8.61	-0.78
0	-2.69	-1.30	-18.45	-2.20*	-11.94	-2.87*	-20.56	-1.43
1	-2.95	-1.33	-21.40	-2.66*	-8.86	-2.40*	-29.42	-1.89
2	2.02	0.57	-19.37	-3.46**	-4.83	-0.85	-34.25	-2.36*
3	-0.14	-0.04	-19.51	-2.32*	2.92	0.44	-31.33	na
4	-0.08	-0.03	-19.59	-2.03*	3.76	0.96	-27.57	-5.53**
5	2.39	0.81	-17.20	-2.03*	5.99	1.07	-21.58	-1.22
6	-5.89	-2.18*	-23.10	-2.04*	2.68	0.76	-18.89	-1.02
Notes: * denotes $p < 0.05$, ** denotes $p < 0.01$ na = not applicable							

These findings somewhat reflect the rumor-driven feature of Malaysian stock market and the old saying amongst the market players, "buy on the rumors", however, "sell on the facts". The saying of "sell on the facts" encompasses analysis and stock recommendations that are made based on the fundamental value of the stock. This is further supported by Mansor and Lim (1995) who concluded that Malaysian investors resorted to fundamental analysis, the increased use of technical analysis, and long-term investment returns during bearish or downturn period. Conversely, investors speculated actively during the bullish period and aimed to make short-term capital gains. The rumor-driven market can be illustrated from the following newspaper's excerpts. Webb (1998) reported in the headline in Wall Street Journal on 20 August 1998 that Malaysia stocks soared 8.8% on the grounds of rumors that authorities bought the shares. Likewise, the rise in blue chips Malaysia stocks after the rumors that Malaysia' central bank would cut its statutory reserve requirements for bank which would boost liquidity in the system as recapitulated by Sivanithy (1998). Another real incident as described by Higgins (1997, p.15) was related to the biggest finance house in Malaysia.

> *"There is more than just smoke in the air when a stolid citizen like the treasurer of All Saints Anglican Church dashes to the headquarters of Malaysia's biggest finance house and, fearful of what might happen while he is away on holiday, demands all his money back. These were due after hearing rumors that the president of the biggest finance house had died. The president was unwell but apparently alive in Paris. The whole climate of unease and everyone know what happened in Thailand."*

Table 3 shows the new buy and new sell recommendations during both pre-financial crisis and financial crisis periods. The new buy recommendation during the financial crisis period shows positive AR of 2.09% on the announcement month but not statistically significant. On the other hand, the new sell recommendations show negative CARs after the release of revised recommendation for the pre-financial crisis and financial crisis periods. It is worth noting that the negative abnormal returns are much larger and significant after the release of new sell recommendation during the pre-financial crisis period. This is consistent with the downward movement in the Malaysian stock market.

The findings of Table 3 reveal that the brokerage analysts in this study are generally quite poor in making recommendations revision except for new sell recommendations. It may be due to investors' greater sensitivity to sell recommendations during financial crisis.

To ascertain about the returns dependency during the sample period, we have further examined the random walk movement by using variance ratio test during pre-financial crisis and financial crisis periods. The results of the variance ratio tests as reported in Table 4 do not reject the random walk hypothesis. The random walk model also implies that the market is in weak form efficient, but not necessarily in semi-strong efficient or higher level of efficiency. The stock market prices are predictable to some degree in an efficient market. Thus, when the Malaysian market index follows a random walk, it is hard but still possible for brokerage analysts and investors to beat the market. Market opportunities need not be market inefficiency (Lo & MacKinlay, 1999).

Table 3: Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) around Recommendations Changes from March 1996 to August 1998							
Breakdown of New Buy Recommendations According to Sub-period							
Pre-financial Crisis Period (Mar 96 - Jun 97)				Financial Crisis Period (Jul 97 - Aug 98)			
Month	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)
-6	-0.53	-0.43	-0.53	-0.41	2.82	1.33	2.82	0.85
-5	-0.10	-0.08	-0.63	-0.35	1.06	0.39	3.87	0.93
-4	-0.81	-0.73	-1.44	-0.58	1.27	0.76	5.14	0.88
-3	0.95	0.78	-0.49	-0.19	1.89	1.08	7.04	1.08
-2	-1.38	-1.16	-1.88	-0.71	-2.57	-1.11	4.46	0.58
-1	-0.76	-0.80	-2.64	-0.76	1.02	0.37	5.48	0.60
0	-0.39	-0.35	-3.03	-1.03	2.09	0.51	7.57	0.85
1	0.38	0.44	-2.65	-0.92	-7.06	-1.34	0.51	0.07
2	-1.77	-1.76	-4.42	-1.23	-7.77	-2.05*	-7.26	-1.61
3	0.89	0.73	-3.53	-1.06	1.26	0.29	-6.00	-0.64
4	-1.68	-1.03	-5.21	-1.10	2.75	0.65	-3.25	na
5	-5.39	-2.50*	-10.60	-1.87	-1.64	-0.59	-4.89	na
6	-2.72	-1.88	-13.32	-2.33*	3.62	1.15	-1.27	-0.10
Breakdown of New Sell Recommendations According to Sub-period							
Pre-financial Crisis Period (Mar 96 - Jun 97)				Financial Crisis Period (Jul 97 - Aug 98)			
Month	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)	AR	AR (t-statistic)	CARs (-6,6)	CARs (t-statistic)
-6	-0.07	-0.03	-0.07	-0.03	-3.97	-1.91	-3.97	-1.31
-5	1.15	0.54	1.08	0.28	-3.04	-1.10	-7.01	-1.92
-4	0.98	0.48	2.06	0.40	-6.86	-2.40*	-13.86	-2.38*
-3	-1.36	-0.70	0.70	0.11	-4.81	-1.31	-18.68	-3.03**
-2	-6.42	-4.02**	-5.71	-0.89	8.73	2.65*	-9.95	-5.17**
-1	-5.41	-3.45**	-11.12	-1.70	-4.43	-1.80	-14.39	-1.72
0	0.50	0.24	-10.62	-1.58	-7.68	-3.06**	-22.06	-2.33*
1	-4.01	-1.64	-14.63	-1.98	-5.05	-2.05*	-27.11	-2.79**
2	-6.88	-2.09	-21.51	-2.22*	2.26	0.59	-24.85	-3.33**
3	-0.94	-0.31	-22.45	na	1.42	0.36	-23.43	-3.94**
4	-1.68	-0.61	-24.13	-2.54*	2.08	0.71	-21.35	-2.51*
5	-5.47	-2.50*	-29.59	-2.95**	6.64	1.96	-14.71	-1.49
6	-9.29	-1.59	-38.89	-3.04**	-1.12	-0.52	-15.83	-1.34
Notes: * denotes p < 0.05, ** denotes p < 0.01 na = not applicable							

Table 4: The Results of Variance Ratio Test of Daily Returns of KLSE CI from March 1996 to August 1998			
Pre-financial Crisis Period (March 1996 - June 1997)			
Lag	Variance Ratio	Homoscedasticity Z (q)	Heteroscedasticity Z*(q)
2	1.17	3.12**	2.56*
4	1.18	1.72	1.42
6	1.04	0.28	0.23
8	0.96	-0.22	-0.18
10	0.98	-0.08	-0.07
12	1.00	0.01	0.01
14	1.02	0.08	0.07
16	1.03	0.14	0.12
18	1.03	0.11	0.10
20	1.03	0.11	0.10
22	1.08	0.29	0.25
24	1.11	0.38	0.33
Financial Crisis Period (July 1997 - August 1998)			
Lag	Variance Ratio	Homoscedasticity Z (q)	Heteroscedasticity Z*(q)
2	1.15	2.46*	2.09*
4	1.18	1.62	1.37
6	1.16	1.11	0.94
8	1.08	0.48	0.41
10	1.03	0.14	0.12
12	1.01	0.05	0.04
14	0.98	-0.07	-0.06
16	0.96	-0.14	-0.12
18	0.96	-0.14	-0.11
20	0.98	-0.08	-0.07
22	1.00	0.00	0.00
24	1.02	0.07	0.06

* denotes p< 0.05, ** denotes p < 0.01

The first test statistic, *Z(q)*, is computed based on the assumption that the error terms are independent, identical, and normally distributed. Thus, the test-statistic can be defined as follows:

$Z(q) = VR(q) - 1 / [\phi(q)]^{1/2} \approx N(0,1)$ where: $\phi(q) = [2(2q-1)(q-1)] / 3q(nq)$

The second test statistic, $Z^*(q)$, allows for a general heteroscedasticity of error terms. The heteroscedasticity consistent standard normal test statistic relaxes the assumption of normality. Thus, the test-statistic can be defined as follows:

$Z^*(q) = VR(q) - 1 / [\phi^*(q)]^{1/2} \approx N(0,1)$

Both test statistics, *Z(q)* and *Z*(q)* are asymptotically standard normal. Then, $\phi^*(q)$, the heteroscedasticity consistent asymptotic variance of the variance ratio is computed as follows:

$\phi^*(q) = Sum [2(q - j)/q]^2$ *Predicted standard deviation (j), where: j = 1,..., q-1*

To find predicted standard deviation *(j)*,

$(j) = [(nq) Sum (X_t - X_{t-1} - m)^2 (X_{t-j} - X_{t-j-1} - m)^2] / [Sum (X_t - X_{t-1} - m)^2]^2$
where: m = predicted mean; numerator t = j+1,..., nq; denominator t = 1,..., nq

Table 5 presents the results of the new buy and new sell recommendations with control for firm size. The results for small firms indicate that release of recommendation changes (month t = 0) appear to generate the largest AR of 3.19% and -7.67% for the new buy and new sell recommendations respectively. The results of the new sell recommendations are very similar to the earlier findings of recommendation changes with greater magnitude of t-statistic. However, it is noted that new buy recommendation for medium firms has generated positive CARs prior and after the release of recommendations changes. The new buy recommendations in large and small firms produce negative CARs and thus reflect less value of revision recommendation and no stock picking abilities by the stockbroking firm on the Malaysian stocks. The investors who followed the buy recommendation would not have achieved positive AR. However, investors who follow the sell recommendations would reduce the capital losses involved, especially for the larger firms.

Table 5 also presents the AR and CARs of the new buy and new sell recommendation after control for monthly volume traded. The higher the volume ratio, the greater the impact of the announcement of the stock recommendation changes. This is indicated by the increase in event month volume compared to the previous six months' average volume. The new buy recommendation with large volume ratio has indicated AR and CARs of 3.87% and 7% respectively during the release period. The new sell recommendation with the large volume ratio generally reported negative AR and CARs. The new buy recommendation for large volume ratio after six months following release month showed CARs of 6.30%. The larger volume ratio is usually associated with higher abnormal returns.

Table 5: Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) with Control for Firm Size and Volume Traded around Recommendations Changes from March 1996 to August 1998							
New Buy and New Sell Recommendations Based on Firms Size Control				New Buy and New Sell Recommendations Based on Volume Ratio Control			
Large Firms				Large Volume Ratio			
New Buy Recommendations		New Sell Recommendations[#]		New Buy Recommendations		New Sell Recommendations[##]	
Month	AR	t-statistic	AR	t-statistic	AR	t-statistic	AR	t-statistic
	10435.81^M	8213.40^S	6507.68^M	6134.87^S	1.80^V	1.84^d	2.06^V	1.92^d
-6	0.36	0.20	0.84	0.34	0.16	0.08	-3.40	-2.40*
-5	-2.27	-1.71	-6.46	-1.47	-1.02	-0.62	1.08	0.70
-4	1.25	0.74	-3.49	-1.27	-0.45	-0.28	-0.55	-0.21
-3	-0.04	-0.02	-6.97	-1.27	2.44	1.57	5.40	2.53*
-2	-0.32	-0.21	10.59	1.98	-0.01	-0.01	-2.36	-0.76
-1	-2.64	-1.66	-6.50	-1.47	2.01	0.89	-4.44	-1.55
0	2.02	1.32	-5.63	-2.24*	3.87	1.58	-6.73	-1.35
1	1.78	0.68	-4.42	-1.32	-1.49	-0.55	-5.70	-2.04
2	-5.65	-1.97	-2.89	-0.51	-6.13	-1.77	4.25	1.13

Table 5: Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) with Control for Firm Size and Volume Traded around Recommendations Changes from March 1996 to August 1998

New Buy and New Sell Recommendations Based on Firms Size Control				New Buy and New Sell Recommendations Based on Volume Ratio Control			
3	-1.90	-0.80	-8.60	-1.46	2.60	0.66	-4.42	-1.05
4	1.99	0.73	-2.32	-0.65	3.72	1.22	2.88	0.85
5	-5.00	-1.69	14.16	2.46*	-2.00	-1.05	0.85	0.24
6	3.92	1.52	-8.97	-2.13*	2.61	0.97	-9.10	-1.83

Medium Firms				Medium Volume Ratio			
New Buy Recommendations		New Sell Recommendations[#]		New Buy Recommendations		New Sell Recommendations[##]	
Month	AR	t-statistic	AR	t-statistic	AR	t-statistic	AR	t-statistic
	2001.33[M]	503.34[S]	1473.40[M]	374.98[S]	0.89[V]	0.14[d]	0.78[V]	0.16[d]
-6	1.21	0.58	-9.84	-3.05**	0.22	0.12	-0.63	-0.22
-5	6.65	2.29*	4.98	1.46	-2.12	-1.11	-3.74	-1.42
-4	0.89	0.50	-1.39	-0.47	-0.60	-0.36	-0.92	-0.34
-3	1.18	0.65	-3.72	-0.81	-1.16	-0.69	-5.75	-1.35
-2	-1.58	-0.61	2.89	0.73	-2.09	-1.09	2.69	0.55
-1	3.78	2.21*	-1.67	-0.66	-1.36	-0.53	-4.55	-2.46*
0	-3.07	-0.72	-3.49	-1.28	-0.07	-0.04	-3.60	-1.64
1	-4.58	-0.87	-3.62	-1.01	-4.46	-2.03	-2.11	-0.78
2	-1.13	-0.32	-2.57	-0.59	-4.21	-1.82	-4.04	-1.83
3	2.07	0.68	-1.66	-0.33	-1.14	-0.82	0.89	0.21
4	2.03	0.63	0.01	0.00	-0.27	-0.08	-0.31	-0.10
5	-5.04	-1.72	-3.00	-1.03	-7.61	-2.07*	5.65	1.74
6	-0.88	-0.26	1.40	0.50	-0.37	-0.13	2.48	0.80

Small Firms				Small Volume Ratio			
New Buy Recommendations		New Sell Recommendations[#]		New Buy Recommendations		New Sell Recommendations[##]	
Month	AR	t-statistic	AR	t-statistic	AR	t-statistic	AR	t-statistic
	732.33[M]	346.17[S]	368.36[M]	195.06[S]	0.47[V]	0.17[d]	0.36[V]	0.16[d]
-6	1.09	0.51	0.48	0.19	2.32	1.08	-4.96	-1.22
-5	-3.47	-1.72	-4.75	-1.75	4.43	1.42	-3.11	-0.54
-4	-1.95	-1.30	-9.79	-1.85	1.30	0.74	-13.23	-2.56*
-3	2.91	1.65	-1.08	-0.25	2.87	1.43	-11.31	-1.77

Table 5: Abnormal Returns (AR) and Cumulative Abnormal Returns (CARs) with Control for Firm Size and Volume Traded around Recommendations Changes from March 1996 to August 1998								
New Buy and New Sell Recommendations Based on Firms Size Control					New Buy and New Sell Recommendations Based on Volume Ratio Control			
-2	-3.78	-1.87	1.04	0.25	-3.56	-1.75	14.21	3.04*
-1	-1.31	-0.43	-6.05	-2.49*	-0.62	-0.33	-5.08	-1.10
0	3.19	1.03	-7.67	-1.60	-1.80	-0.39	-6.46	-2.33*
1	-5.47	-1.47	-6.37	-2.02	-2.32	-0.38	-6.68	-1.52
2	-6.29	-2.44*	5.28	0.94	-2.61	-0.80	-0.32	-0.04
3	2.93	0.63	12.83	3.43**	1.78	0.40	5.97	0.85
4	-3.49	-0.78	5.70	1.08	-2.82	-0.69	0.84	0.16
5	-1.31	-0.42	-0.30	-0.07	-1.63	-0.54	3.90	0.60
6	-3.09	-1.44	-2.38	-0.57	-2.31	-0.80	-3.38	-1.19

Notes:
* denotes p < 0.05, ** denotes p < 0.01, na = not applicable
M denotes average market value in RM millions, S denotes average standard deviation of market value
v denotes average volume ratio, d denotes average standard deviation of volume ratio
new sell recommendations for large, medium and small firms have shown negative CARs, except month -6 of large and small firms.
CARs of small firms are significant in month -2 and month 2.
new sell recommendations for large, medium and small volume ratio firms have shown negative CARs, except month -2 and -3 of large volume ratio firms. CARs of small volume ratio firms is significant in month -3, -2, 1, 2,3, and 4.
b new buy recommendations for medium volume ratio firms have indicated negative CARs except month -6 (CAR = 0.22%).
CARs are significant in month 4, 5, and 6.

CONCLUSION

The results show that the brokerage analysts' revised recommendation conveys certain valuable information to investors with respect to new sell recommendation. This result is consistent with the study done by Womack (1996).

The patterns of recommended changes appeared linked to the trend of the market performance. In a downturn stock market, new sell (downgrade) recommendation conveys more valuable information than new buy (upgrade) and hold recommendations. The findings imply lack of superior returns and investment value provided by brokerage analysts in respect to their new buy or new hold revised recommendations, particularly in the downward market whereby the short selling practice is prohibited. With respect to these, it is suggested that brokerage analysts enhance their stock selection and market timing abilities.

The results also suggest that investors receive the stock revision recommendation earlier and to consider slightly shorter investment period. The results conclude that the Malaysian stock market is efficient to some degree, nonetheless, it is possible but very difficult for brokerage analysts to make consistently superior returns.

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ACKNOWLEDGEMENTS

EVIDENCE OF A LINK BETWEEN DECISION STRATEGY SELECTION AND AUDITOR PERFORMANCE DURING ANALYTICAL PROCEDURES

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ABSTRACT

This study provides evidence that increasing the use of directed processing strategies during analytical procedures improves diagnostic performance. In a computerized process-tracing experiment, experienced auditors performed planning analytical procedures and documented planning concerns for case materials with seeded inconsistencies. Findings provide evidence of a positive association between diagnostic performance and directed strategies, which involve construction of an abstract problem representation. There is also evidence that the use of directed strategies increase as experience increases, but that experience does not account for all of the performance benefits attributable to directed strategies.

INTRODUCTION

Does the approach an auditor uses to process information affect the likelihood that he/she will correctly diagnose problems encountered during preliminary analytical procedures? This study provides evidence that information processing strategy can influence auditor performance during planning analytical procedures.

Auditors use analytical procedures to direct attention toward accounts that might be misstated and should be considered for more detailed audit tests. When auditors perform poorly, by failing to identify potential problems during planning analytical procedures, audit effectiveness may suffer, sometimes with disastrous consequences. During preliminary analytical procedures, auditors use relationships, trends, and ratios to "test" the reasonableness of financial statement numbers and reveal the potential for misstatements. Auditors compare their expectations with actual numbers. When analytical procedures results are not consistent with expectations, the auditor must diagnose the cause of the fluctuation. Some fluctuations signal a misstatement and require an audit adjustment. However, some fluctuations are caused by a change in underlying conditions and involve no misstatements.

The auditor's challenge is to correctly diagnose the cause of the fluctuation. To make the diagnosis, auditors acquire and evaluate additional information using either a *directed processing approach* [1] or a *non-directed processing approach* [2]. Decision makers who use directed strategies

rely on "mental checklists" to provide evaluation criteria that *direct* information acquisition. While decision makers who use *non-directed* strategies acquire the next available cue then conduct an evaluation. In other words, auditors who use a *directed* approach tend to construct an abstract problem representation then iteratively generate and test hypotheses. While auditors who use a *non-directed* approach tend to develop a detailed problem representation and a list of plausible diagnoses before attempting to evaluate any potential problems.

In a computerized experiment we conducted in auditors' offices, experienced auditors analyzed comparative financial information that contained seeded inconsistencies. We developed software that allowed us to maintain a sequential record of all information acquisitions. This enabled us to examine how the auditors obtained information to diagnose fluctuations.

Findings suggest that diagnostic accuracy increased as the use of directed strategies increased; a positive correlation was found between directed strategy and diagnostic accuracy. This suggests that auditors may be able to improve decision performance by identifying more effective strategies for directing attention during analytical procedures. Although evidence suggests that the tendency to rely on directed strategy is positively associated with experience, there is evidence that experience does not explain all of the performance benefits attributable to directed strategy.

The information processing strategy auditors use during analytical procedures plays a key role in their decision performance (Biggs et al., 1995). While decision strategies can differ across several dimensions (Payne et al., 1993), the extent to which auditors employ directed strategies to search for and evaluate information should impact their performance (Libby, 1985). This study examines the association between the use of directed strategies and the likelihood that auditors will correctly diagnose potential problems during planning analytical procedures.

In a computerized process-tracing field study, experienced auditors documented planning concerns while analyzing comparative financial information that contained seeded inconsistencies. Findings suggest that diagnostic accuracy increased as the use of directed strategies increased. These results provide evidence that auditors may be able to improve decision performance by identifying more effective strategies for directing attention during analytical procedures. Identifying the specific processes that make directed strategies more effective is beyond the scope of this study, but findings provide direction for future research that examines why directed strategies improve performance and how auditors can learn to use them.

The rest of this study is organized into four sections. The first section explains the theoretical foundation and presents research hypotheses. The second section describes the field study that provided data for testing those hypotheses. The third section (a) describes how the variables were measured, (b) explains the steps taken to assess the validity of those measures, and (c) presents results of hypothesis tests. The last section summarizes the findings, proposes avenues for future research, and acknowledges the limitations of this study.

THEORETICAL FRAMEWORK

Auditors use analytical procedures while planning engagements to direct attention toward accounts that might be misstated and should be considered for more detailed audit tests (Hirst &

Koonce, 1996). When auditors perform poorly, by failing to identify potential problems during planning analytical procedures, audit effectiveness may suffer, sometimes with disastrous consequences (Wright & Ashton, 1989). Because this mandatory audit procedure can have a significant effect on audit quality, considerable effort has been devoted to understanding the factors that influence auditor performance (Biggs et al., 1995).

Research suggests that the decision strategy auditors use to direct information acquisition and evaluation during analytical procedures influences the likelihood of diagnosing financial statement errors (Bedard & Biggs, 1991). Auditors who make more extensive use of directed strategies for processing decision cues are likely to perform better (Libby, 1985). When using directed strategies, decision makers rely on "mental checklists" to provide *ex ante* evaluation criteria that direct cue acquisition. On the other hand, when using non-directed strategies, decision makers acquire the next available cue, then conduct an *ex post* evaluation (Maines, 1995).

In the context of analytical procedures, this mental checklist represents diagnostic hypotheses, which are provided by the knowledge auditors bring to the task (Libby & Frederick, 1990). Knowledge of financial statement errors, which can be acquired through training programs, direct experience, and indirect experience passed on through peers, provides auditors with analytical procedures expertise (Bonner & Lewis, 1990). Expert auditors (those who perform more effectively) use different search patterns while acquiring and evaluating information than novice auditors (Bedard & Biggs, 1991).

In general, experts tend to use decision strategies that focus on the deeper structures of a problem-solving task while novices tend to use strategies that focus on surface features (Adelson, 1984). As an example, consider typical differences in expert and novice decision strategies for diagnostic reasoning. Experts tend to construct an abstract problem representation then iteratively generate and test hypotheses (focus on deeper structures) while novices, who are less likely to render a correct diagnosis, tend to develop a detailed problem representation and a list of plausible diagnoses (focus on surface features) before attempting to evaluate any potential problems (Johnson et al., 1981).

Research Hypotheses

Prior research has demonstrated that the strategy used for processing decision cues affects human judgment and choice (Payne et al., 1988). Hunton and McEwen (1997) suggest that directed processing will be used to accomplish decision strategies that focus on analyzing the deeper structures of relations among decision cues, but strategies that focus on differences in the surface features of decision cues are more likely to be accomplished through non-directed (sequential) processing. They found evidence that the accuracy of analyst forecasts improved as reliance on directed processing strategies increased.

In an analytical procedures context, Bedard and Biggs (1991) found that auditors used a variety of information processing strategies while attempting to diagnose a seeded error. However, auditors who relied more on the directed strategy of constructing diagnostic hypotheses before acquiring the cues needed to test them performed better than auditors who scanned cues in order of presentation then considered diagnostic value after the cue had been acquired. These findings, when

considered in light of the theoretical foundation described above, suggest the following, alternative-form research hypothesis:

H$_1$:   Diagnostic accuracy will improve as the proportional use of directed strategies increases.

Experience in a decision domain increases the likelihood of using certain decision strategies and, correspondingly, diminishes the likelihood of using others (Payne et al., 1993). Knowledge of possible financial statement errors provides a basis for using directed strategies during analytical procedures (Libby, 1985) and audit experience provides the opportunity for developing that knowledge (Libby & Frederick, 1990). As a consequence, it is reasonable to expect that experience will influence strategy selection as articulated by the following, alternative-form research hypothesis:

H$_2$:   The proportional use of directed strategies will increase as audit experience increases.

Research has provided compelling evidence that experience improves auditor performance during analytical procedures (Libby & Luft, 1993). It may be that experience is the essential ingredient for better performance and that directed processing is merely a by-product of experience. If this is the case, then evidence of a positive association between directed strategy and performance has little practical value. However, if some portion of the association between directed strategy and diagnostic accuracy is not explained by experience, then there is reason to believe that other factors might improve performance by influencing strategy selection. Evidence to that effect would provide incentive for attempting to identify those factors through future research.

Payne et al. (1993) suggest that task and environmental variables will influence strategy selection. However, there is no basis in the context of this study for hypothesizing associations between performance and variables other than experience. Consequently, this important issue is addressed through the following exploratory hypothesis:

EH: The correlation between experience and directed strategies will account for some, but not all of the correlation between directed strategies and diagnostic performance.

METHODOLOGY

These hypotheses were tested with data from a computerized process-tracing field study. Experienced auditors, from three of the largest international accounting firms, performed planning analytical procedures for a hypothetical client using computerized case materials. All participants

were either seniors or managers, and all had experience using analytical procedures to plan audit engagements. The experiment, which took about one hour to complete, was administered to small groups at participating firms' offices. One of the authors was present at all times and participants used their own notebook computers to complete the task.

Case Materials

Two cases were prepared, a control case and an experimental case. The control case provided a baseline for evaluating the impact of manipulations used to create the experimental case. Both cases were designed to be equivalent in terms of variables in the audit environment that have been shown to influence decision performance, including time pressure (McDaniel, 1990), accountability (Kennedy, 1993), task structure (McDaniel & Kinney, 1995), and task complexity (Tan & Kao, 1998).

Both cases described a furniture manufacturing company that had a substantial earnings increase during the examination period as a result of higher sales volume. Materials included instructions, a description of the client, a memo documenting the initial audit planning meeting with the chief financial officer, and three displays of accounting information, including comparative balance sheet, income statement, and selected financial ratios. The experimental case was identical to the control case except for the information provided in the planning meeting memo.

The planning memo for the control case provided explanations for the sales increase that were consistent with changes in the financial statement accounts participants would examine during their task. The planning memo for the experimental case contained two descriptions that were inconsistent with changes in accounting information. First, the chief financial officer attributed sales increases to more aggressive marketing, which was inconsistent with stable selling expenses from last year to this year. Second, he stated that no new debt had been incurred to finance the expanded production activity, which was inconsistent with increased interest expense.

Description of the Experiment

As participants arrived at the conference room where the experiment was conducted, they were given a form explaining that they would be asked to use analytical procedures to make audit planning decisions and that their participation was voluntary. If they agreed to participate (none refused), they were asked to mark a range indicating the number of times they had used analytical procedures to plan audit engagements. Then, while participants loaded process-tracing software onto their computer, the authors assigned each auditor a participant number. This number, which had to be entered to start the experiment, determined the version of the case materials that would be provided and was assigned so that experience ranges would be consistent between cases.

When all participants were ready to start, the group was told that they would be examining different case materials and that some would finish their task sooner than others, then instructed to enter their participant number and begin. Participants were asked to provide demographic information then complete a tutorial that demonstrated how to acquire information. The tutorial

required that they access information from all displays and also demonstrated how to use the text editor for documenting concerns.

After completing the tutorial, participants were provided with instructions for the task and asked to read the client description and planning meeting memo. After reading these narratives, participants were presented one at a time, with six multiple-choice questions about the information contained in the planning memo (which differed between the control case and the experimental case). If the participant clicked on the right answer, their correct response was acknowledged and the next question was presented. If the participant's response was incorrect, they were informed that their answer was wrong, the planning meeting text was immediately displayed, and the participant was instructed to re-examine the text and mark the correct answer. When the correct answer had been marked, the next question was displayed. The questions provided assurance that participants had accurately attended to information that differed between cases.

After providing correct responses to all six questions, participants were instructed to perform planning analytical procedures and document any planning concerns that should be evaluated further. They were allowed unrestricted access to three displays, including comparative balance sheet, income statement and financial ratios. Participants could also use the text editor to document planning concerns at any time and could return to narrative information about client background or the planning meeting memo as often as they desired.

When one of the three available financial statements was selected, account or ratio titles were displayed, but the numbers were blank. When participants clicked on the item title, four pieces of information were displayed, including the current and previous balance and the amount and percent of change from last year to this year. However, when participants moved their pointer off of the item title, this information was erased. Participants could examine information again by clicking on the item title. This feature allowed the software to maintain a sequential record of all information acquisitions.

After participants completed their evaluation, indicated that all planning concerns had been documented, and chose to terminate their analysis, they were instructed to indicate which, if any, account balances differed from their expectations. For all balance sheet and income statement accounts, participants were required to mark a box indicating whether the current balance was (a) higher than expected, (b) lower than expected, (c) about the same as expected, or (d) not examined. Participants could not return to the financial information or to their documentation during this task.

RESULTS AND ANALYSIS

A total of 30 audit seniors and managers took part in this study. Half analyzed the control case and half analyzed the experimental case. Participants had an average of 4.5 years of audit experience and all had used analytical procedures to plan engagements. On average, participants looked at 48 of the 52 different information items available, including financial statement totals and financial ratios, and examined 28 of the 29 account balances presented on the income statement and balance sheet. They acquired comparative information about account balances and ratios an average of 137 times and, on average, spent 46 minutes completing their task.

Quantifying the Variables

Tests of hypotheses involve five variables, including (1) proportional use of directed strategy, (2) experience, (3) variation in directed strategy attributable to experience, (4) variation in directed strategy not attributable to experience, and (5) diagnostic accuracy. The process used for assigning values to each of these variables is explained below.

Directed strategy was measured using information search patterns evidenced by the process trace data gathered while participants conducted their analyses. All information acquisitions were classified as having been acquired either using directed strategies or non-directed strategies. Following the rationale explained below, each information acquisition was classified as the target of directed strategy if it was not adjacent to the previous acquisition, otherwise the acquisition was classified as the target of non-directed strategy. To quantify the proportional use of directed strategy (*PercentD*), the number of information acquisitions targeted by directed strategy was divided by the total number of information acquisitions.

During planning analytical procedures, auditors typically examine account balances displayed in financial statement format (Hirst & Koonce, 1996) where the information needed to construct patterns of related accounts is usually not displayed adjacent to the account being evaluated. For example, if auditors wanted to construct a plausible explanation for the change in accounts receivable, they would need information about changes in either sales or revenue-cycle financial ratios. Information about cash and inventory, while adjacent, would not be useful for configuring most diagnostic patterns and useful cues would generally have to be retrieved from different statements in other sections of the display.

Hunton and McEwen (1997) exploited these characteristics of financial statement format to distinguish between directed and non-directed strategy. Directed strategy requires information about related accounts, which are not grouped together on financial statements. Therefore, directed strategy involves jumping around the information display while non-directed strategy can be accomplished by examining the next available (adjacent) account information. Consequently, directed strategy is evidenced by information acquisitions that are not adjacent while non-directed strategy is evidenced by information acquisitions that follow presentation order[3].

Experience was measured using the number of months participants had worked as auditors (*Months*). To segregate directed strategy explained by experience from directed strategy attributable to other factors, the (dependent) variable *PercentD* was regressed on the (independent) variable *Months*[4]. The value predicted by that regression provides a measure of the variation in *PercentD* that is explained by variation in *Months*[5]. The predicted value of *PercentD* was used to quantify variation in directed strategy explained by experience (*DP-Exp*) and the residual was used to quantify variation in directed strategy not explained by experience (*DP-Other*).

Descriptive statistics for all processing variables and results for tests of differences between the control case (n = 15) and experimental case (n=15) are presented in table 1.

Diagnostic accuracy was distinguished by determining whether participants targeted the accounts for which inconsistencies had been seeded in the experimental case. Two measures were combined to determine which accounts were targeted for further investigation: (1) accounts

documented as planning concerns during the task and (2) accounts for which changes were unexpected, as indicated after the task had been completed.

Table 1: Descriptive Statistics Test for Difference Between Cases						
Statistics for Both Cases Combined (n = 30)						
	Mean	SD	Min	Max	T statistic	P-value
PercentD	0.35	0.10	0.15	0.52	0.14	.8886
Months	54.26	35.61	21.00	162.00	0.10	.9206
DP-Exp	0.35	0.04	0.30	0.47	0.10	.9206
DP-Other	0.00	0.10	- 0.19	0.15	0.19	.8485
InfoItems	48.03	3.44	40.00	52.00	1.11	.2738
TtlAccts	28.20	1.68	21.00	29.00	0.86	.4004
TaskTime	46.40	14.69	20.17	69.20	0.88	.3855
TtlCues	137.56	50.81	75.00	276.00	0.47	.6410
DP-Exp:	Variation in PercentD explained by Months (predicted value).					
DP-Other:	Variation in PercentD not explained by Months (residual).					
InfoItems:	Number of different information items examined (of the 52 available).					
PercentD:	Number of directed strategy cues divided by total cues examined.					
TaskTime:	Minutes spent examining information and documenting conclusions.					
TtlAccts:	Number of different account balances examined (of the 29 available).					
TtlCues:	Total information acquisitions.					
Months:	Number of months of audit experience.					

During the experiment, participants documented planning concerns with the text editor. Both authors examined participants' documentation, listed the accounts for which concerns were documented, then compared lists and reconciled differences. Immediately after completing their task, participants indicated which accounts involved unexpected fluctuations (where the change was greater or smaller than expected). An account was considered to have been targeted as a potential problem (*Problem*) if the account was documented as a planning concern and also marked as an unexpected fluctuation.

This classification algorithm quantifies the number of unexpected fluctuations that auditors targeted as potential problems during their task while controlling for two possible sources of

measurement error: (1) concerns that were mentioned in the documentation but were troublesome for some reason other than the interperiod change, and (2) unexpected fluctuations that were satisfactorily explained during the analysis and, therefore, not documented as a planning concern.

Performance was measured as the number of seeded inconsistencies diagnosed by each participant who evaluated the experimental case (n = 15). The inconsistency related to aggressive marketing was considered diagnosed if selling expenses were targeted as a *Problem*[6]. The inconsistency involving interest was considered diagnosed if interest expense was targeted as a *Problem*. The variable used to quantify diagnostic accuracy (*Perform*) was assigned a value of zero if neither inconsistency was diagnosed, one if either inconsistency was diagnosed, or two if both inconsistencies were diagnosed. Of the 15 participants who examined the experimental case, eight diagnosed both inconsistencies, three diagnosed only one, and four diagnosed neither.

Validity Checks

The control case provided a basis for addressing two internal validity issues. First, whether the manipulations used for seeding inconsistencies influenced information processing strategies. Second, whether the seeded inconsistencies provided a reliable performance measure.
Seeded inconsistencies in the experimental case were intended to establish a criterion performance measure without creating additional complexity that would change decision strategy. Toward this end, inconsistencies were seeded by manipulating expectations rather than changing account balances. Furthermore, the manipulations were designed so that correct diagnoses could be achieved by recognizing an inconsistency for one account rather than having to configure a pattern of related accounts. Between-case processing differences provide a basis for testing whether this design objective was achieved.

As reported in table 1, there were no significant processing differences between the control case and the experimental case. The proportional use of directed strategy (*PercentD*) did not differ between cases. There were no significant between-case differences in the number of available information items (*InfoItems*) or account balances (*TtlAccts*) that were examined. Furthermore, total processing time (*TaskTime*) and total information acquisitions (*TtlCues*) did not differ significantly between cases. These findings suggest that seeding inconsistencies did not influence strategy selection.

If the seeded inconsistencies provided a reliable performance measure, then selling expenses and interest expense should have been targeted by more auditors in the experimental case than in the control case. Table 2 presents a listing of all accounts that were targeted as a *Problem* in both cases. Eight auditors in the experimental case targeted selling expenses compared to only three in the control case, and eleven auditors in the experimental case targeted interest expense compared to only four in the control case. Chi-square tests indicate that these differences are significant at the $p < .05$ level and that there were no significant between-case differences for any other accounts. These findings suggest that the seeded inconsistency manipulations were successful.

Table 2: Accounts Targeted as Potential Problems			
	Number of Times the Account was Targeted as a Problem		
Account Title	Interperiod Change	Control Case	Experimental Case
		(n=15)	(n=15)
Accounts receivable (net)	12 %	5	5
Inventory	2 %	7	7
Machinery and equipment	0 %	1	1
Accumulated depreciation	12 %	0	1
Accounts payable	- 5 %	6	7
Accrued expenses	8 %	1	2
Long-term debt	- 15 %	4	2
Cost of goods sold	12 %	2	3
Selling expenses	0 %	3	8**
Shipping expense	8 %	3	2
Bad debts expense	8 %	7	4
General expenses	0 %	2	3
Interest expense	6 %	4	11**
** Chi-square test indicates that the difference is significant at the p<.05 level.			

Tests of Hypotheses

Spearman correlations between variables in the experimental case provide support for both research hypotheses[7]. H$_1$ predicts that diagnostic accuracy will improve as the proportional use of directed strategy increases, which is supported by a significant (p = .0081), positive correlation between *Perform* and *PercentD* (n=15). H$_2$ predicts that the proportional use of directed strategy will increase as audit experience increases, which is supported by a significant (p = .0114), positive correlation between *PercentD* and *Months* (n=15).

The exploratory hypothesis examines whether the correlation between experience and directed strategy will account for some, but not all of the correlation between directed strategy and diagnostic accuracy. There is a significant (p = .0081), positive Spearman correlation between *Perform* and *DP-Exp*, which suggests that experience accounts for some of the association between directed strategy and performance. However, there is also a significant (p = .0320), positive

Spearman correlation between *Perform* and *DP-Other*, which suggests that experience does not account for all of the association between directed strategy and performance.

DISCUSSION

This study provides evidence that information processing strategy can influence auditor performance during planning analytical procedures. Findings provide evidence of a positive correlation between directed strategy and the diagnostic accuracy auditors achieve during analytical procedures. Although evidence suggests that the tendency to rely on directed strategy is positively associated with experience, there is evidence that experience does not explain all of the performance benefits attributable to directed strategy.

These findings raise two questions that provide considerable motivation for future research. First, which directed strategy alternatives produce superior performance? This study examines a measure of overall processing strategy but does not identify individual components of directed strategy. Second, what factors other than experience inspire auditors to use directed strategies? This study provides evidence that experience cannot account for all performance benefits attributable to directed strategy but does not examine how other task and auditor variables influence strategy selection.

Verbal protocol research could be used to identify the specific directed strategy strategies that produce more effective results. Auditor reasoning during analytical procedures can be decomposed into productions, which are conditional action rules embodied by if-then statements (Anderson et al., 1991). If auditors were asked to provide concurrent verbal protocols while performing planning analytical procedures, the effectiveness of different productions could be examined. Bedard and Biggs (1991) used this approach to evaluate the effectiveness of productions employed by auditors who attempted to diagnose a known error from selected cues. Verbal protocols are costly and time-consuming to gather. However, the cost might be reduced by developing process-tracing software that prompts participants and records verbal comments during their analysis. Adding such a feature to the software developed for this study would not be particularly difficult.

Future studies could be undertaken to develop a process model for planning analytical procedures. The computerized process-tracing approach used in this study could be employed to develop a detailed description of directed strategy sequences used for evaluating cues. The relative effectiveness of these diagnostic alternatives could then be assessed. This type of approach has been used to build computational models for internal control review (Meservy et al., 1986) and audit risk assessment (Peters, 1990).

Factors that influence strategy selection could be examined by manipulating the conditions under which auditors perform planning analytical procedures. Decision strategy selection is adaptive in nature and can be influenced by task conditions (Payne et al., 1988). A number of variables in the audit environment have been shown to influence decision performance, including time pressure (McDaniel, 1990), accountability (Kennedy, 1993), task structure (McDaniel &

Kinney, 1995), and task complexity (Tan & Kao, 1998). Future research could examine the extent to which these factors influence decision strategy selection during planning analytical procedures.

The research agenda described above could provide valuable insight for practicing auditors. A better understanding of the specific diagnostic procedures that produce effective results could help auditors improve performance during analytical procedures. Better analytical procedures lead to more effective planning which improves overall audit efficiency (Wright & Ashton, 1989). Audit firms routinely train their staff to seek explanations only for account balance changes above a predetermined scope (threshold) when performing planning analytical procedures (Biggs et al., 1995). Future research might demonstrate that this non-directed strategy is less than optimal under certain conditions.

Some limitations must be considered when interpreting the results from this study. As with any experimental examination, findings may reflect differences in how auditors react under the artificial conditions imposed by the experiment, rather than how they make decisions in the field. For example, the process-tracing methodology used in this study was intrusive. Auditors in the field need only move their eyes to acquire the next decision cue while participants in this study had to move and click their pointing device. Although both activities represent motor functions and the requirement to acquire information with the mouse was imposed uniformly on all participants, it may be that this feature changed the cognitive processes used by the participants.

The small sample size limits the number of alternatives available for testing associations among variables. Research designs with enough observations to support path analysis or structural equation modeling could produce more in-depth evidence of how task and auditor variables influence performance by changing strategy selection. Findings reported in this study are tenuous in light of the sample size and evidence that directed strategy improves performance must be considered preliminary in nature, until replicated through a research design that provides a more powerful test.

ENDNOTES

[1]   A directed processing approach is top-down and focuses on deeper structure.

[2]   A non-directed processing approach is bottom-up and focuses on surface features.

[3]   Hunton and McEwen (1997) used the coefficient of correlation between the order of presentation on the display and the order of acquisition to measure the extent to which participants selected cues that were not spatially adjacent rather than classifying each acquisition as either directed or non-directed.

[4]   An ordinary least-squares regression was run on the combined sample for both the control case and the experimental case (n = 30). The model has an r-square of .13 and Months has a t-statistic of 2.12 (p = .0426).

[5]   The residual from that regression provides a measure of variation in PercentD that is not explained by variation in Months.

[6]   These selling expense accounts included (1) compensation, (2) catalogs and promotions, and (3) other.

[7] Non-parametric correlation was used for all tests because of the small sample size and because, while all variables are clearly ordinal in nature, Perform only has three levels and is not likely to constitute an interval measure.

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GOODWILL AND AMORTIZATION:
ARE THEY VALUE RELEVANT?

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ABSTRACT

The Financial Accounting Standards Board (FASB) proposed different methods for the treatment of goodwill after acquisition. Just recently, the FASB issued a new accounting standard requiring no amortization but periodic assessment of goodwill for impairment. This treatment implies that goodwill has an indefinite economic life. An earlier proposal suggested amortization of goodwill over a maximum of 20 years. This treatment implies that the contribution of goodwill to the generation of revenue is finite. This study examines whether the equity markets value goodwill as an economic resource and, if so, whether or not amortization of goodwill is related to the market value of the firm. Such research is vital to the evaluation of the treatment of goodwill in domestic and international accounting standards.

An analysis of five consecutive years of financial statement data for 96 firms (480 firm-year observations) indicates that goodwill is positively associated with firm value. Furthermore, goodwill amortization has a significant negative relation with equity values in some individual years and in an analysis with the data pooled across years. Together, these results imply that the market views goodwill as an economic resource that declines in value, and the decline in value is related to the amortization methods used by firms in the sample.

INTRODUCTION

Economic goodwill reflects the ability of a company to earn an excess return on investment. Economic goodwill may be attributed to the company's reputation, superior technology, superior management, or other favorable characteristics that enable the company to earn excess returns. In some cases, these favorable characteristics may be maintained for long periods, but in other cases, they diminish rapidly

Accounting standards in the United States specify that a company recognizes goodwill only when the goodwill is acquired through a purchase transaction, e.g., goodwill appears on the consolidated financial statements as a result of a merger of two business entities. Accounting standards define goodwill as the difference between the purchase price and the fair value of the net assets of the acquired company. This accounting treatment implies that goodwill is initially valuable for the purchasing firm: goodwill generates a future stream of earnings and cash flow. The way in which amounts are assigned to goodwill raises the possibility that the goodwill recognized in a purchase may not always represent superior future earnings potential, i.e., economic goodwill.

Differences between the purchase price and the fair value of net identifiable assets may result from an excessive price paid for an acquisition or from including in the purchase price the investment banking and legal fees, financing costs, or other costs not related to the future earnings potential of an acquisition.

A recent change in U.S. accounting standards, Financial Accounting Standards Board (FASB) Statement No. 142, Goodwill and Other Intangible Assets (FASB, 2001, hereafter referred to as Statement 142), prohibits systematic amortization of goodwill. As suggested by Statement 142, if goodwill produces positive cash flows indefinitely, and there is no apparent decline in value, then greater representational faithfulness might be achieved if goodwill is capitalized and periodically reviewed for impairment rather than systematically amortized. However, if goodwill declines in value without an adjustment through either amortization or a write-down, if impaired, assets and income are overstated, and the financial statements are not representationally faithful. Under the prior accounting standard, firms amortized goodwill over a period not exceeding 40 years. Similarly, current international accounting standards require amortization over a period not exceeding 20 years. If goodwill does not produce cash flows in perpetuity and a decline in value is apparent, then better representational faithfulness may result from a policy of capitalization and subsequent amortization. The FASB struggled with the issue of how to account for goodwill after acquisition since placing the topics of business combinations and intangible assets on the project agenda in 1996. After much deliberation, the FASB first proposed to require straight-line amortization of goodwill over a period not to exceed 20 years with a periodic review for impairment (FASB, 1999). By 2001, this view changed. Statement 142 prohibits amortization of goodwill and requires periodic assessment of impairment. Whether amortization on a straight-line basis is consistent with the investors' assessment of goodwill is debatable. However, whether or not amortization is associated with firm market value is testable.

In this study, we examine whether the market views the systematic amortization of goodwill as consistent with equity value. Several studies have found goodwill to be positively related to the market value of equity. However, few studies examine goodwill amortization because of the difficulty in obtaining amortization data, and the results of those studies are mixed.

In our analysis, if the market values goodwill, then goodwill should be related positively and significantly to the market value of equity. If goodwill declines in value and if firms' amortization rates are consistent with the decline in value, then amortization expense will be related negatively to the market value of equity. Alternatively, if we find no significant relation between amortization expense and equity value, then the implication is that the market does not view this accounting treatment as informative. This would be the case if goodwill does not decline in value or if firms use inappropriate amortization methods or rates.

We estimate, through regression analysis, the relation between the market value of equity and various balance sheet and income statement numbers including goodwill and goodwill amortization. The results of our analysis of data from the years 1992 through 1996 indicate that the relation between goodwill and the market value of equity is positive for all years examined and statistically significant in four of the five years. These results are consistent with our predictions and previous research and imply that investors value recorded goodwill as an asset. The relation between goodwill amortization and the market value of equity for the same period is negative, as

predicted, and statistically significant in some years and in the analysis of data pooled across years. We interpret these findings to indicate that the market views goodwill as an economic resource with a declining value, and the decline in value is associated with the amortization recognized.

This study differs from prior studies in several important ways. First, because few firms report goodwill amortization, the sample is limited to firms with continuously declining goodwill. By so doing, it is possible to measure goodwill amortization directly as the difference between goodwill reported in successive years. Second, goodwill proxies for success, particularly for firms with continuing acquisitions. Because successful firms tend to engage in more acquisitions, the goodwill variable may be related to the market value of equity simply because it proxies for past good performance or expected future performance. Furthermore, goodwill amortization is an aggregation of the amortization of previously purchased and recently purchased goodwill. If goodwill is a wasting asset, but newly acquired goodwill proxies for expected future performance, then goodwill amortization may possess both positive and negative valuation implications. If so, it would be difficult to predict the sign of the goodwill amortization variable. We are able to ameliorate this problem by limiting the sample to firms with continuously declining goodwill, that is, firms with no recent acquisitions. Third, we examine both goodwill and amortization in the same analysis instead of treating the two issues separately. Last, this study differs from other studies because it uses data obtained directly from audited financial statements.

The remainder of the paper is organized as follows. The next section discusses previous literature. A discussion of the research question and the method used to address it follows. Next we describe the data and present our results. The last section discusses the implications of our findings.

PREVIOUS RESEARCH

Prior studies have modeled both balance sheet and income statement effects of goodwill. The results of most studies imply that goodwill is valued as an asset by the market (Amir, Harris, & Venuti, 1993; Chauvin & Hirschey, 1994; McCarthy & Schneider, 1995; Barth & Clinch, 1996; Vincent, 1997; Henning, Lewis, & Shaw, 2000), but results pertaining to amortization of goodwill are mixed.

Because goodwill is not always separately reported and few firms report goodwill amortization, Jennings, Robinson, Thompson, and Duvall (1996) conducted a mail survey to request goodwill and amortization data They examine the relation between the market value of equity and the book values of liabilities, property, plant and equipment, goodwill, and assets (excluding goodwill and property, plant, and equipment). They reason that if goodwill has value, the data will show a positive relation between goodwill and equity value. However, if the value of goodwill decays rapidly, no association will be observed between goodwill and equity values. Results indicate that the estimated coefficient on goodwill is positive and highly significant in each of the years studied.

To investigate amortization, Jennings et al. (1996) regress the market value of equity on expected future earnings excluding goodwill, expected goodwill amortization, expected depreciation

expense, risk, and projected growth. If goodwill has a limited life similar to tangible assets, then amortization should be viewed by the market as similar to depreciation and be negatively associated with equity values. If goodwill generates cash flows indefinitely, there should be no association between equity values and goodwill amortization. The results of this model are mixed. The sign of the estimated coefficient on amortization changes from year to year leading the authors to conclude that investors do not view purchased goodwill as an asset that declines in value for all firms. To better control for omitted variables, Jennings et al. use a fixed effects regression model that pools observations over time. Results of that analysis support the theory that goodwill amortization is significantly negatively related to the market value of equity.

Moehrle, Reynolds-Moehrle, and Wallace (2001) find that earnings before the amortization of intangible assets including goodwill is as informative as earnings including amortization in explaining annual common stock returns. However, the two earnings numbers are highly correlated (the reported correlation coefficient exceeds 0.99). Jennings, LeClere, and Thompson (2000) employ a larger sample than used in previous studies including firms with recently purchased goodwill. They find that earnings before goodwill amortization explains more variation in share price than earnings after goodwill amortization indicating that amortization simply adds noise to the measurement of earnings.

RESEARCH QUESTION AND METHOD

Results of prior research associating the amortization of goodwill with market value of equity have produced results that are inconclusive, conflicting in sign across years, weakly supportive, or non-supportive. We test the association of goodwill and goodwill amortization with the market value of equity over a five-year period adapting a levels model developed by Landsman (1986) which equates market values to book values. We include an abnormal earnings variable, hypothesized by Feltham and Ohlson (1995) to explain differences between market and book values.

Feltham and Ohlson (1995) model the relation between the market value of a firm and the book value of a firm. Their model equates the market value of equity at any point in time to the book value of equity at the same point in time and the net present value of expected abnormal earnings. Following Amir, Kirshenheiter, and Willard (1997), the net present value of expected abnormal earnings is operationalized as accounting earnings less expected normal earnings where expected normal earnings is defined as the risk free rate times the beginning book value of equity of the firm. This leads to model (1) which describes a firm's market value as a function of its book value and its earnings potential:

$$MVE_i = \alpha_0 + \alpha_1 BVE_i + \alpha_2 AE_i + \epsilon_i \tag{1}$$

Where MVE_i = the market value of equity, firm i,
BVE_i = the book value of equity, firm i,
AE_i = abnormal earnings, firm i.

Feltham and Ohlson (1995) suggest that components of earnings aggregate without loss of information. Likewise, disaggregation should not cause loss of information. Thus, we modify Model (1) to separate goodwill from the book value of equity and separate goodwill amortization from abnormal earnings.

$$MVE_i = \beta_0 + \beta_1 BVLGW_i + \beta_2 GW_i + \beta_3 AEPA_i + \beta_4 AMORT_i + \epsilon_i \qquad (2)$$

Where MVE_i = the market value of equity, firm i,
$BVLGW_i$ = the book value of equity, firm i, less accounting goodwill,
GW_i = accounting goodwill, firm i,
$AEPA_i$ = abnormal earnings, firm i, adding back goodwill amortization, and
$AMORT_i$ = goodwill amortization, firm i.

We expect the estimated coefficient on the book value of equity less goodwill (BVLGW) to be positive and statistically significant. Similarly, if goodwill is value relevant, the estimated coefficient on goodwill (GW) also should be positive and statistically significant. However, if goodwill quickly declines in value, there should be no relation between goodwill and market equity values.

In theory, abnormal earnings explain differences between the market values and the book values of equity. If abnormal earnings persist, the estimated coefficient on this measure (AEPA) will take on a value greater than zero. If abnormal earnings diminish rapidly, this coefficient will not be statistically different from zero. If the amortization of goodwill reported by the firms in our sample is value relevant, then its estimated coefficient (AMORT) should be statistically significant and negatively related to equity value. If goodwill amortization does not reflect investors' assessment of the decline in value of goodwill or if goodwill does not decline in value for many firms, then amortization and the market value of equity will not be related. If so, the coefficient on goodwill amortization will be insignificantly different from zero.

DATA AND SAMPLE SELECTION

Jennings et al. (1996) discuss the possibility that the estimated coefficient on goodwill may be upwardly biased if goodwill proxies for a variable omitted from the model that is related to market value and goodwill. They reason that successful firms are able to engage in more acquisitions. For these firms, higher goodwill values may proxy for past good performance or expected future performance. Because market values reflect past and expected performance, goodwill may be positively and significantly associated with the market value of equity simply because it is related to prior success or expected future success. Similarly, for firms with continuing acquisitions, goodwill amortization is an aggregation of the amortization of previously acquired and newly acquired goodwill. If goodwill is a wasting asset but newly acquired goodwill proxies for expected performance, it is difficult to predict the sign for the coefficient on goodwill amortization.

That is, goodwill amortization is an aggregation of amounts with positive and negative valuation implications.

Table 1		
Mnemonics, COMPUSTAT Database Definitions, and Variable Computations		
Variable	Mnemonic	COMPUSTAT Item number/ calculation
Book value of common equity	BVE	item 60
Common shares outstanding	SHARES	item 25
Earnings per share	EPS	item 58
Goodwill	GW	item 204
Operating income after depreciation	INCOME	item 178
Price at fiscal year-end	PRICE	item 199
Total assets	ASSETS	item 6
Abnormal earnings	AE	$INCOME - 10\%(BVE_{t-1})$
Abnormal earnings plus amortization	AEPA	AE + AMORT
Amortization of goodwill	AMORT	$GW_{t-1} - GW_t$
Book value of equity less goodwill	BVLGW	BVE - GW
Market value of equity	MVE	PRICE x SHARES
Ratio of goodwill to market value of equity	GW/MVE	GW/MVE

To address these issues and the difficulty of determining amortization (COMPUSTAT does not report amortization, but it does report net goodwill) our sample is comprised of firms with continuously declining goodwill. Only in purchase transactions is new goodwill recognized. In the absence of such an event, amortization for any one year is the difference between the current year balance of goodwill and the prior year balance of goodwill. Because the analysis covers the five-year period from 1992 to 1996, goodwill values for 1991 through 1996 are required to calculate amortization for each year. Our approach does not necessarily eliminate firms with new acquisitions. It is possible that firms in our sample made acquisitions that resulted in no new goodwill or very small incremental amounts of goodwill, and yet we observed a year-to-year decline in the balance of goodwill. However, the estimated amortization is constant and declining for 78 percent of the sample firms. For the remaining firms, either a change in the amortization rate occurred or the recorded goodwill from a new purchase was less than the amount of goodwill amortized in that year.

Initially, we included all companies that report goodwill and are traded on the NYSE or AMEX (COMPUSTAT tape COMP$96F). This resulted in 4,449 observations with values for goodwill in fiscal years 1992 through 1996. We deleted 2,084 observations with missing price or other accounting data needed for the analysis. We further deleted 1,865 observations for firms without consecutive declining goodwill leaving 500 observations in the sample. Following Amir et al. (1997), we eliminated 20 observations (4%) for which the absolute value of the R-student statistic (regression residual divided by the residuals' standard error) was greater than 3.0 in order to minimize the effect of data outliers. The final sample includes 480 observations in total, 96 firms each with five consecutive years of data.

Table 1 presents a list of variables used in this study and the COMPUSTAT item number for each. We use share price at fiscal year-end times the common shares outstanding at fiscal year-end to calculate the market value of equity, the dependent variable in the analysis. The independent variables are year-end total common stockholders' equity less goodwill, year-end goodwill, expected abnormal earnings, and goodwill amortization for the year. Expected abnormal earnings are calculated as operating income less expected normal earnings (the risk free rate times the beginning book value of common stockholders' equity). We calculate amortization as the difference between the previous year's reported goodwill and the current year's reported goodwill. Similar to Amir et al. (1997) and Penman (1996), we used ten percent as the risk free rate. Because ten percent appears high, we tested the sensitivity of the results to a five percent rate. The results were very similar to those reported below.

RESULTS

First, we examine whether the sample is representative of the population of firms reporting goodwill. For several financial statement items, Table 2 presents a comparison of our sample firms to the population of firms reporting goodwill. The sample and the population are statistically different for all variables except the ratio of goodwill to the market value of equity. The mean (median) market value of equity is $869.4 ($188.4) million and $2,446.0 ($441.4) million for the sample and population, respectively. Mean (median) goodwill is $157.9 ($14.7) million and $273.5 ($39.1) million for the sample and population, respectively. Abnormal earnings, book value of equity, earnings per share, operating income, goodwill, and total assets are significantly smaller for the firms in our sample than for the population of firms reporting goodwill. This is a consequence of our sample selection procedure. To measure goodwill amortization directly from audited financial statements, it was necessary to select firms without new acquisitions accounted for by the purchase method. Essentially, this procedure selected firms that are smaller than average. However, the mean of the ratio of goodwill to the market value of equity (0.23) does not differ between groups. Clearly goodwill is material in amount for firms in the sample and the population, and goodwill does not differ in relative magnitude between the two sets of firms. The Appendix describes an alternative sampling procedure designed to test the sensitivity of the findings of this study to the sample selection procedure.

Table 2				
Descriptive Statistics - Sample vs. Population Reporting Goodwill (in millions)[a]				
	Sample[b]		Population[c]		Comparison[d]
	Mean	Median	Mean	Median	Prob >|T|
Abnormal earnings	91.19	12.34	213.78	31.01	0.0001
Abnormal earnings plus amortization	100.47	14.66	--[e]	--[e]	--[e]
Amortization	9.28	0.80	--[e]	--[e]	--[e]
Book value equity	394.16	120.44	994.94	195.67	0.0001
Book value equity less goodwill	236.31	78.97	721.19	117.18	0.0001
Earnings per share	0.58	0.70	1.96	0.98	0.0103
Goodwill	157.85	14.74	273.54	39.09	0.0001
Market value equity	869.36	188.38	2,445.98	441.38	0.0001
Operating income	112.45	21.09	284.00	46.54	0.0001
Ratio book value to market value equity[f]	0.59	0.59	0.52	0.50	0.0857
Ratio goodwill to market value equity[f]	0.23	0.07	0.23	0.09	0.8788
Total assets	1,802.17	327.51	4,369.41	542.96	0.0001

Notes:

[a] All amounts are reported in millions except for earnings per share.

[b] The sample consists of 480 observations.

[c] The population includes all firms that report goodwill on the NYSE or AMEX (COMPUSTAT tape COMP$96F) for the years 1992 through 1996. Not all data items are available for every firm in the population. Observations vary from 4,153 to 4,446 per five-year period.

[d] The comparison column contains results of a t-test comparing the mean of the sample to the mean of the population to determine if the two groups are statistically equivalent.

[e] Amortization, in this study, is based on declining goodwill. The population is not restricted to firms with declining goodwill. Therefore, amortization is not estimated for this group.

[f] We calculate the ratio for each observation and then calculate an average and median for each ratio.

Table 3 presents results of an estimation of equation (2) for each year, 1992 to 1996, and the sample pooled across the five years (labeled as panel B in Table 3). White's statistics range from 41.46 to 76.75 and indicate the existence of heteroskedasticity in the standard errors. Accordingly, the ordinary least squares estimates and t-statistics are based on White's (1980) consistent estimates of the variability of the coefficient estimates. Alternatively, as a correction for heteroskedasticity, we reestimate the yearly regressions using total assets as a deflator. A discussion of the alternative analysis appears in the Appendix.

Table 3						
The Relation of Book Value of Equity, Goodwill, Abnormal Earnings, and Goodwill Amortization to Equity Market Value						
$MVE_i = \beta_0 + \beta_1 BVLGW_i + \beta_2 GW_i + \beta_3 AEPA_i + \beta_4 AMORT_i + \epsilon_i$						
Year	β_0	β_1	β_2	β_3	β_4	Adj. R^2/N
Panel A: Year-By-Year Regressions						
1992	101.08	1.37	2.25	0.45	-11.08	0.84
	(2.33)	(8.69)	(6.88)	(1.24)	(-2.97)	96
1993	207.23	1.45	1.83	1.30	-6.14	0.71
	(2.91)	(6.61)	(3.32)	(1.52)	(-0.95)	96
1994	125.48	1.41	1.53	2.19	-9.76	0.80
	(1.96)	(8.92)	(2.68)	(1.33)	(-1.75)	96
1995	195.59	1.31	1.61	1.37	-5.78	0.78
	(2.67)	(5.49)	(4.02)	(1.19)	(-1.07)	96
1996	91.08	1.27	0.52	4.60	-0.28	0.82
	(1.21)	(3.01)	(0.70)	(2.08)	(-0.03)	96
Panel B: Data pooled over the years 1992-1996 (Random Effects Regression)						
Coefficient	186.50	1.48	1.62	1.20	-4.83	0.89
t-statistic	(2.67)	(18.52)	(9.51)	(7.43)	(-3.67)	480

Notes:

In Panel A, the first row shows ordinary least squares coefficient estimates and the second row shows t-statistics based on White's (1980) consistent covariance estimator for each year.

Panel B reports results of a random effects regression which allows inferences to be drawn about a population from a small sample. A random effects model controlling for yearly effects with the use of dummy variables produced nearly identical results.

Values for one tailed t-tests are as follows:
t=0.10   1.29
t=0.05   1.66
t=0.025 1.98
t=0.01   2.37
t=0.005 2.63

As predicted, the estimated coefficient on the book value of equity less goodwill (BVLGW) is positive and statistically significantly greater than zero for all years. In addition, as predicted, the estimated coefficient on goodwill (GW) is positive for all years and statistically significant in four out of the five years. This implies that the market values goodwill as an economic resource. The estimated coefficient on abnormal earnings (AEPA) is positive in each year but not consistently statistically significant, possibly implying that abnormal earnings are not persistent. The estimated coefficient on amortization (AMORT) is signed correctly in each year and statistically significant

in two of five years. Because amortization is small relative to the market value of equity, it may be difficult to detect statistical significance in small samples. This may account for the lack of significance in some years.

To increase the power of our tests, we examine a random effects model which pools observations across time (1992 through 1996). Results of the Hausman test suggest the use of a random effects model rather than a fixed effects model (Hausman, 1978). The random effects model is appropriate for this study because it allows inferences to be made about a larger population, whereas the fixed effects model produces results conditional on the units in the data set.

The results appear in Panel B of Table 3. The estimated coefficients on the variables representing book value of equity less goodwill, goodwill, and abnormal earnings are all statistically greater than zero, and the coefficient on amortization is statistically less than zero as predicted. These results imply that the market views recognized goodwill as value relevant. Furthermore, the amortization of goodwill matches investor expectations (directionally, at least) of the decline in value of goodwill.

In both panels, the coefficient on goodwill appears to be larger than the coefficient on the book value of equity less goodwill. However, statistical tests comparing the two coefficients indicate they are not different in years 1993 through 1996 (F = 1.76, 0.009, 0.88, and 2.25, respectively) or in the random effects regression (F=1.06). Only in 1992 are the coefficients statistically different (F = 15.26). These results imply that investors value goodwill in a manner similar to other assets.

LIMITATIONS AND CONCLUSIONS

This study examines the valuation of goodwill and goodwill amortization by the equity market. The coefficient on goodwill is statistically significant in each year except the final year of the test period. Thus, a policy in which the purchasing firm initially records goodwill as an asset is consistent with market valuation. Furthermore, the market continues to value amortized goodwill several years beyond the time of its initial recording. Thus, a policy requiring the immediate write-off of goodwill is not consistent with our analysis.

Goodwill amortization exhibits a significantly negative relation with equity values in some individual years and in an analysis pooled across years. The systematic amortization of goodwill appears consistent with equity value. Together, these results imply that the market views goodwill as an economic resource that declines in value, and the decline in value is associated with the amortization methods used by firms in the sample.

The availability of data on goodwill amortization presents a difficulty in studying the goodwill issue. As a rule, firms do not separately report goodwill amortization amounts. To overcome this difficulty, we selected only firms with decreasing goodwill and measured amortization as the yearly change in the reported goodwill amounts. A potential limitation of the study stems from the sample selection procedure. This procedure resulted in the selection of smaller firms and may have resulted in the selection of firms with lower expected growth rates. Yet, the magnitude of goodwill relative to firm size does not differ between sample firms and non-sample

firms that report goodwill. Thus, the impact of this potential selection bias on the results is difficult to assess and difficult to overcome because firms are not required to report goodwill amortization. However, our sample selection procedure allows direct measurement of goodwill amortization from the financial statements. And because the sample consists of firms with continuously declining goodwill, the influence of new acquisitions on the goodwill and goodwill amortization coefficients should be minimal. The Appendix describes the results of the analysis of an alternative sample that addresses this potential limitation. Additionally, the research method does not allow us to differentiate the amortization of excessive merger costs capitalized as goodwill from the amortization of core components of goodwill. This is an interesting topic for future study. Because of the elimination of amortization of goodwill with Statement 142, the identification of costs appropriate for assignment to goodwill takes on additional significance.

Nevertheless, the results of this study have implications for accounting standards on this issue. Statement 142 ends amortization of goodwill and requires periodic testing of goodwill for impairment. This policy is based on the belief that much of the recorded goodwill is either not a wasting asset, or, if wasting, it is replaced by internally generated goodwill. Thus, the assumption is that the amount reported on the balance sheet does not overstate the underlying goodwill absent an impairment event. The results of this research are not consistent with this assumption. On the one hand, if goodwill is not a wasting asset, then one would predict a coefficient on goodwill amortization that is not statistically different from zero. On the other hand, if acquired goodwill is a wasting asset, but replaced by internally generated (and unrecognized) goodwill, then one would predict a positive rather than negative coefficient for goodwill amortization. Our evidence of an inverse relation between goodwill amortization and the market value of equity is consistent with a practice of amortizing goodwill over its expected economic life.

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APPENDIX

The purpose of the Appendix is to describe alternative research methods designed to provide some assurance that our findings are not artifacts of the method that we used. We also provide statistics to support the findings discussed in the paper.

First, positive correlation (Pearson correlation coefficients range from 0.41 to 0.66) exists between the market value of equity and all independent variables. As expected, we find a very high correlation between goodwill and amortization. Goodwill and abnormal earnings plus amortization are also highly correlated. High correlation between independent variables suggests a possible multicollinearity problem in the estimation procedures. Several measures were used to assess the possible effects of collinearity on our results. First, regression models were estimated individually for goodwill and goodwill amortization. The results were similar to those reported. Second, we examined variance inflation factors (VIFs). VIFs in excess of 10 indicate that multicollinearity may influence the regression coefficient estimates (Neter, Kutner, Nachtsheim, & Wasserman, 1996). All VIFs were less than 4.14. Finally, one sign of a multicollinearity problem is the presence of a high regression F-statistic accompanied by insignificant regression coefficients (Neter et al., 1996). This is not the case with our results.

Second, to assess the stability of our results to an alternative specification of our research design, we conducted the analysis with the book value of total assets as a deflator. The coefficients on book value of equity less goodwill, goodwill, and abnormal earnings are positive and statistically significant in each year except for the coefficients on goodwill in 1994 and 1996, which are positive but only marginally significant. The coefficient on amortization is negatively related to market values in all years and statistically significant in three of the five years. Thus, these results are similar to those reported and imply that investors view recognized goodwill as an asset and goodwill amortization as a measure of its diminution.

Third, we estimated the regression models with the market price of a share of stock measured at three months after the end of the fiscal year (in addition to the fiscal year-end price) as the dependent variable. The result of this analysis is similar to the findings presented earlier.

Fourth, a random effects model with dummy variables to control for yearly differences was estimated. Results from this model were almost identical to those presented.

Fifth, the sample selection procedure resulted in the selection of firms smaller than the average of all firms reporting goodwill. To assess the impact of this selection bias on the results, we tested an alternative sample. First, we identified all firms reporting a decrease in net goodwill during any two-year period from 1991 to 1996. Goodwill amortization is the difference between the previous year's goodwill and the current year's goodwill. These data are used to reestimate equation (2). The primary difference in samples is that the alternative sample does not require five consecutive years of declining goodwill, and any reported decrease in net goodwill is assumed to represent goodwill amortization. This procedure increases the sample sizes significantly (ranging from 463 observations in 1992 to 526 observations in 1996). Descriptive statistics for the alternative sample reveal few differences from the population of all firms reporting goodwill. The coefficient estimates for goodwill are positive and statistically significant in each year and the magnitudes are similar to those previously reported. Coefficient estimates for the amortization variable are negative but smaller in magnitude yet statistically significant in four of five years.

THE DIMINISHING WEEKEND EFFECT: EXPERIENCE OF FIVE G7 COUNTRIES

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ABSTRACT

The well-known weekend effect is diminishing in recent years as Monday returns exhibit an upward trend and turned positive while Friday returns became insignificant in major equity indices of Canada, France, Germany, Japan and United Kingdom. A power ratio method is developed to consistently measure the relative contribution of Friday and Monday returns to the return of the week in each individual year. The revealed dynamics of the anomaly explain why previous studies report different or conflicting results. There are evidences that challenge the existing literature on the size effect related to the anomaly.

INTRODUCTION

Numerous researchers have performed tests for the existence of seasonal anomalies or calendar effects in equity returns at the daily, weekly and monthly levels. Many of them have reported abnormally positive average Friday returns and significantly negative average Monday returns in the U. S. and international equity markets. Pioneer research on the so called "weekend effect" can be found in Cross (1973), French (1980), Gibbons and Hess (1981), Hindmarch (1984), Keim and Stambaugh (1984), and Jaffe and Westerfield (1985). Major studies for the anomaly in international equity markets include articles by Gultekin and Gultekin (1983), Theobald and Price (1984), Jaffe and Westerfield (1985), Jaffe, Westerfield and Ma (1989) and Dubois and Louvet (1996), and Tong (2000). The authors report negative average Monday returns in the international equity markets.

Several researchers explore possible factors that contribute to the anomaly. Hindmarch (1984) suggests that institutional trades can partially explain the effect, and Sias and Starks (1995) believe that institutional traders are the primary drivers of the effect. Lakonishok and Maberly (1990) and Abraham and Ikenberry (1994) report that share price does worse on Mondays than on other days of the week in the US, because individual investors typically sell stocks on Monday. Branch (1974, 2001) suggested that the Monday effect may be related to weekly cycle in news releases and to weekly pattern in interest rate changes; and that both Mondays and merger announcements have a significant impact on stock market volatility. Branch and Echevarria (1991) indicate that the effect occurs mainly in stocks that do not go ex-dividend on Monday. Schatzberg and Datta (1992) assert that some factor unrelated to information arrivals causes the weekend effect, but Steeley (2001) suggests that a systematic pattern of market-wide news arrivals drives the anomaly in the UK stock market. Coutts and Hayes (1999) indicate that the effect is in part a stock exchange account settlement effect in major UK indices. Cross (1973) finds positive correlation

between Monday and Friday returns. Abraham and Ikenberry (1994) see the positive correlation between Monday and Friday returns as "most acute in small-and medium-sized companies." Keim and Stambaugh (1984) report a strong relation between Friday returns and firm size.

Other researchers report different findings. Cornell (1985) and Najand and Yung (1994) see no weekend effect in the S&P 500 index futures: the effect seems to exist, they argue, because the returns are affected by conditional heteroskedasticity. Connolly (1989) points out that the effect disappears for some years and then reappears for others. Wang, Li, and Erickson (1997) find that the Monday effect occurs primarily in the last two weeks (the fourth and fifth weeks) of the month. For the UK stock market, Board and Sutcliffe (1988) see the significance of the anomaly decreasing over time, and Steeley (2001) notes that the weekend effect disappeared in the 1990s. Sullivan, Timmermann and White (2001) assert that calendar effects, including day of the week effect, no longer remain significant in the context of 100 years of data as the full universe. Brusa, Liu, and Schulman (2000) find reverse weekend effect in recent data for major stock indices: Monday returns are positive and significantly greater than the preceding Friday's. They also report that the reverse weekend effect is strong and significant in large-company stocks. Seyed and Perry (2001) report evidence of reversal of the Monday effect in major US equity markets.

Existing studies offer inconsistent or even conflicting reports, because they look at constant coefficients of dummy variables or average returns of the days for their relatively short sample periods, except Seyed and Perry (2001) who estimated recursive coefficients. These methods cannot reveal the dynamics of the effect: during the whole period, one type of observations would overweigh the other if the number of weeks with an abnormal Friday and Monday is greater than the number of weeks without it, or if the effect is extremely strong in certain weeks. In this study, a power ratio method is developed to calculate the effect of each individual year, and hence can answer the question why previous researchers report inconsistent or conflicting results, and reveal the dynamics and trend of the effect.

METHODOLOGY AND DATA

To reveal possible trends of the weekend effect, one needs to measure the return of Friday and Monday relative to the return in the remaining trading days of the week for each individual year. It would be difficult to measure the weekend effect when a Friday (Monday) return and return of the week have opposite signs. For example, when a Friday (Monday) is positive, but the week is negative, or when Friday (Monday) is negative and the week is positive, and when both Friday (Monday) and the week are negative. A power ratio method is developed that gives a consistent measurement of the contribution of Friday and Monday returns to the return of the week. The Friday, Monday, and weekly returns are calculated as the natural logarithm differentials of the index values. For the early years when a market was open on Saturdays Monday's return is then computed from Saturday's close to Monday's close, and Saturday's return is used for the weekend effect. Now define

$$R^*_F = (1+ \text{mean Friday return})^5 \tag{1}$$

Where the power 5 is used because there are 5 trading days in a week, except holidays. Obviously R^*_F is always greater than zero. And

$$R_w = (1 + \text{mean weekly return}) \tag{2}$$

R_w is always greater than zero. Then, compose a ratio

$$\frac{R^*_F}{R_w} \tag{3}$$

which may be called "power ratio" since R^*_F is a factor of power. Now it should be clear that when $R^*_F/R_w > 1$, then Friday return is higher than the average of other days of the week. When $R^*_F/R_w = 1$, then Friday return is as good as the average of other days of the week; and when $R^*_F/R_w < 1$, then Friday return is below the average of other days of the week. The same power ratios are calculated for Monday returns for each year.

The daily close data includes the Canadian Toronto Stock Exchange (TSE) 35 from 1986 and TSE 300 from 1976, the French CAC 40 from 1987 and SBF 250 from 1968, the German FAZ 100 from 1956, the Japanese Nikkei 225 from 1955, the U.K. FT 30 from 1950 and FT 700 from 1969. All the data is through October 2001. Except the Nikkei 225, all the indices are value weighted. Using value weighted indices make the effect of large stocks on returns more apparent. The Nikkei 250 is price weighted but using it does not overstate the effect of small stocks on returns because there is no small stock in it. The indices with larger numbers are composed of smaller stocks. This study chooses indices so as to avoid issues related to portfolio formation, such as size-beta correlation, size-price correlation, and survivorship.

DYNAMICS OF THE ANOMALY

Charts 1 through 5 display the annual Monday and Friday power ratios. The averages of all the years are presented at the right side of each chart. As displayed in the charts, the weekend effect generally existed until recently. Particularly, the anomaly is apparent for the Japanese Nikkei 225, and for the U.K. FT 30 in the 1970s and 1980s, for the TSE 300 in the 1970s and 1980s, and for the CAC 40 in the late 1980s and early 1990s.

There is a clear upward trend in Monday returns for all the indices except the Nikkei 225 and SBF 250. Especially, Monday returns outperform Friday returns for a few years in the late 1990s for the FAZ 100, the SBF 250, and the Nikkei 225. These results are similar to what Kanara (1997), Brusa et. al. (2000) and Seyed (2001) have found in the U.S. equity markets. A possible explanation for the phenomenon is that as the anomaly became well known in the 1980s, more sophisticated investors would take actions to exploit excess returns. Chow, Hsiao and Solt. (1997) find success in using weekend return pattern to produce superior returns, especially for weekends with large negative Friday returns. The excess return seeking activities may sometimes reverse the effect or eventually make it disappear. However, the number of years when the phenomenon emerges might

not be sufficient to evidence, or it might be too early to announce "reverse day-of-the-week effect" as an anomaly in these markets yet. As one may notice, Friday returns also exhibit an upward trend in the Canadian and French indices over the last several years, and both Friday and Monday returns display a downward trend in the Nikkei 225 from late 1980s to late 1990s. Similarly, as Gu and Finnerty (2002) pointed out, the U.S. stock markets have been gaining efficiency over the last two decades. The diminishing weekend effect may indicate further evidence that the markets are becoming more efficient, or that investors are improving at pricing risk adequately, or both. Finally, if one only looks at the average (or the coefficient of a dummy variable) as did in the traditional literature, one may still claim weekend or Monday effect because the average Friday return is still higher than average Monday return for all the indices.

There are some evidences that are inconsistent to the report that the weekend effect is stronger in small and medium-sized companies (Abraham & Ikenberry, 1994), and that Monday returns are still negative for small stocks (Kamara, 1997; Seyed & Perry, 2001). The FT 30 consists the largest stocks while the FT 700 comprises smaller stocks, the weekend effect is stronger in the FT 30, which is particularly apparent in the 1970s and 1980s, than in the FT 700, which is particularly apparent only in the 1980s. However, there is evidence supporting the findings that the reverse weekend effect is more apparent in large stocks (Brusa, Liu & Schulman, 2000; Seyed & Perry, 2001). The TSE 35 contains the largest companies, it shows more Monday returns that are better than Friday returns in the 1990s compared to the TSE 300 which contains smaller companies.

A simple regression analysis shows that the effect is stronger when the market is more volatile and that this relation may not be linear. But the causation is not clear, high Fridays and low Mondays would result in a volatile market, investors may buy more on Fridays and sell more on Mondays when the market is volatile, or both. In the regression, the ratio of Rf/Rw to Rm/Rw is used as the dependent variable. The ratios are all positive, which avoids the problem of different signs. Obviously, the stronger the effect (higher Friday return and lower Monday return), the greater the ratio. The standard deviation and variance of daily returns are the independent variables, which may capture any nonlinear relation between the effect and volatility. Using daily return volatility is better than using weekly return volatility for the purpose because a stellar week can increase weekly volatility. The coefficient for standard deviation is positive and that for variance is negative, and both are significant at one-percent level.

CONCLUSION

Evidence from major stock markets in Canada, France, Germany, Japan and United Kingdom indicates a diminishing trend in the weekend effect, and shows that the anomaly is not always related to company size. The diminishing weekend effect logically implies that after the effect is well known sophisticated investors may fully or over exploit the opportunity for abnormal returns, hence eliminating or even sometimes reversing the effect. The declining and disappearing weekend effect may also represent a trend toward market efficiency. More experienced and knowledgeable investors along with advances in information technology (greater quantity, better quality, lower cost of information, faster communication and order execution), tend to make the market more efficient. In

fact, developed markets are more efficient than less developed and emerging markets. This may encourage believers in the theory of efficient markets to regain some confidence.

Further research is required to discover unknown factors and the changes in the known factors that attribute to the anomaly, and to reveal the dynamic correlation between the weekend effect and the relevant factors. Further tests should be performed to reveal any trend in other asset market anomalies--such as the January and turn-of-month effects. Finding possible trends and the factors that contribute to these trends would explain some aspects of stock price behavior, which would have valuable implications for investment strategies and risk management.

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GROWTH STOCKS OUTPERFORM VALUE STOCKS OVER LONG TERM

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ABSTRACT

Previous studies have generally found that returns on growth stocks, or stocks with high price-to-earnings (PE) ratios, often lag behind those of value stocks, or stocks with low PE ratios. This study examines the long-term (up to 18 years) performance of growth stocks versus value stocks when a buy-and-hold strategy is adhered to. The study examines the performance of growth versus value stocks of portfolios created during the periods 1983 through 1987. The findings of this study indicate that the long-term performance (14 plus years) of growth stocks is higher than the long-term performance of value stocks for portfolios created during the years included in this study. After only five years, however, the growth stocks lagged behind the value stocks. These results tend to support the efficient market hypothesis.

INTRODUCTION

The efficient market hypothesis suggests that the price-earnings (PE) ratio shows what investors think about the future growth opportunities of the company. Thus theory suggests that growth stocks or stocks perceived to be growth stocks tend to have PE ratios higher than average. Prior studies have found that high long-term forecasted growth and high current earnings growth tend to be associated with high PE ratios (Penman, 1996; Cho, 1994; Fairfield, 1994; Zarowin, 1990).

However, a number of academic studies provide evidence to dispute this theory. Previous research has found that value stocks (low PE stocks) are actually more attractive than growth stocks (high PE stocks). The findings of these studies indicate that low PE securities tend to outperform high PE stocks. Lakonishok, Shleifer, and Vishny (1994) examine five-year holding periods and confirm that the returns on growth stocks lag behind the return on stocks that have low price-earnings ratios over five year horizons. Basu (1977) finds that during the 14 year period April 1957 through March 1971, the low PE portfolios, on average, earned higher rates of return than the high PE portfolios.

The indication of these studies is that high PE stocks are overvalued, a violation of the efficient market hypothesis. That is investors who are seeking capital gains and future growth of earnings, may irrationally place too high a premium on the potential growth of these companies.

Besley and Brigham (2003) define growth stocks as "stocks of firms that have many positive net present value opportunities." More generally, growth firms "exhibit sales and earnings growth

rates that significantly exceed the industry averages." Another definition might be a stock that is expected to show above-average capital appreciation in the future. Conversely, a value stock is a stock of a company whose fundamental information indicates that the true value of the company is higher than the stock price. Fundamental information includes information about financial strength, industry conditions, and economic conditions. A value-oriented investor prefers to buy stocks whose PE is below the current market average, and is especially attracted to a stock when the market average PE is lower than its historical average.

Siegel (1995) analyzes future returns on a portfolio of high growth stocks in the 1970s which were known as the nifty-fifty. Siegel's study indicates that these stocks were almost continually undervalued relative to the market after the mid-1970s through to the end of the study period 1995. Undervaluation indicates that the total return of the stock is greater than the return of the market index, while overvaluation means the opposite. The results of Siegel's study suggests that over the long-term, investing in growth stocks may pay-off. However, his study does not report the return on a comparable portfolio of value stocks over this time period. This could be problematic since survivorship bias is present in these types of studies.

To truly assess the performance of growth stocks, a long-term horizon, assuming a buy-and-hold strategy must be examined and comparable portfolios of value stocks and growth stocks must be included in the study. My study examines the returns of growth stocks versus value stocks over the long-term, up to eighteen years. The sample period covered in this study is from the end of 1983 to November 2001. A reasonably recent time period was selected, as the results would be more relevant to readers. Consistent with prior studies, the five-year returns of the value stocks exceeded those of growth stocks. However, the results show that the average return of high PE stocks outperforms that of low PE stocks over long periods, up to 18 years. These results tend to support the efficient market hypothesis and suggest that price-earnings (PE) ratios do, in fact, reflect what investors think about the future growth opportunities.

An important question that many investors have is "What does all of this mean for the future performance of growth stocks?" Unfortunately, a study of this nature nor any other study can answer this question. This study shows that growth stocks outperform value stocks over the particular test period of this study. However whether or not the performance can be replicated is a much more difficult question to answer. However the results of the study suggest that if investors are interested in holding their portfolios over the long-term, incorporating a diverse group of growth stocks mixed with value stocks and middle PE range stocks into their portfolios may enhance long-term performance.

DATA AND METHODOLOGY

For each of the five years of portfolio formation, 1983 through 1987, market value, price-earnings ratio, stock price, and the standard industrial classification (SIC) code were obtained for every company included from the Compustat Industrial Files. The PE ratio obtained from compustat represents the year-end close price divided by the twelve-months moving earnings per share. For each of the five portfolio data sets, annual stock price and cash dividends per share was

obtained for each of the years from the portfolio formation date through to November, 2001. (November, 2001 is the latest date for which this information is available on Compustat).   All stock prices are adjusted for stock splits and stock dividends.   Annual returns are adjusted for after-tax cash dividends per share for which the payable dates occurred during the reporting period.   Cash dividends are also adjusted for stock splits and stock dividends.

To be included in the study, stock price and cash dividends per share must be available for all years from the date of portfolio formation through November 2001.   Three steps were taken to mitigate survivorship bias and to support the creation of comparable value versus growth portfolios.   First, the PE ratios must be positive in the year of portfolio formation to be included in the sample. Second, the firms were divided into to size groups and only large firms are included in this study. Third firms with returns greater than three standard deviations away from the mean were excluded from the sample.

For each of the five years of portfolio formation, 1983 through 1987, the sample of firms is ranked by PE ratio into three groups: value stocks, middle stocks, and growth stocks.   The value stocks include 20% of the firms with lowest PE ratios.   The growth group contained firms with PE ratios in the top 20%.   The remaining firms were included in the middle group.

RESULTS

Tables 1 through 5 report the performance of the growth stocks versus value stocks through November 2001 for each of the five years of portfolio formation.   The results indicate that over the first five years or so after portfolio formation, the performance of the growth stocks lags behind that of the value stocks.   However, after the seventh or eighth year, the value indexes for the growth stock portfolios, in general, pass up that for the value stocks. Graphs 1 through 5 illustrate the results.

Table 6 summarizes the five, ten, and fourteen year performances of the portfolios by formation year. At the fifth year after portfolio formation, the value stocks have our-performed the growth stocks for all portfolio formation years, except 1983.   At the tenth year after portfolio formation, the growth stocks have out-performed the value stocks for all portfolio formation years, except 1987.   At the fourteenth year, the growth stocks have out-performed the value stocks for all five of the portfolio formation years.

Previous studies also indicate that market-wide determinants explain the variation in P/E ratios over time (White, 2000; Kane , Marcus & Noe, 1996; Good, 1991).   These studies, overall, find significant relationships over time between PE ratios and economic indicators such as market volatility, inflation rates, bond yields, money supply, and GDP growth.   The results of these studies tend to support the efficient market hypothesis and suggest that price-earnings (PE) ratios do, in fact, reflect what investors think about the future growth opportunities.   However, these studies also suggest that PE ratios can vary over time which means of course that high PE ratios are vulnerable to general downward shifts, as well.   And of course, downward shifts may affect the high PE stocks with more severity than the low PE stocks.

However examination of the tables and graphs reveals that over the period of this study the growth stocks, overall, clearly out-perform value stocks over time. Further, there do not appear to be any periods in which value of high PE stocks were severely affected by downward shifts in stock prices. Even during the years 2000 and 2001, when growth stocks were thought to have lost much of their "glamour", overall, the high PE stocks seem to have held their value, and still are quite a bit ahead of the value stocks.

The performance of the S&P Index was also included for comparative purposes in Table 6. The performance of all of the portfolios in this study are higher than that of the S&P Index. However, this is expected since some survivorship bias is inherent in this type of study. However, as mentioned before, survivorship bias has been mitigated somewhat by inclusion of only positive PE stocks and large stocks in the sample. These mitigating sample techniques also bias the results upward but also give better representative portfolios of growth versus value stocks for comparative purposes.

Tables 7 and 8 report an industry analysis of growth stocks versus other stocks in the years of portfolio formation. As can be seen from Table 7, a relatively larger proportion of growth stocks are in the manufacturing sector (SIC classification # 3). However this participation drops off slightly. The proportion of growth stocks in manufacturing was 50.3% in 1983 and 30.8% in 1987. Also, a relatively larger proportion of value stocks are in the transportation and communications sector (SIC classification # 4). However this participation drops from 47.4% in 1983 to 17.3% in 1987. Another observation from Table 7 is the increase in the proportion of value stocks which are financial institutions (SIC classification # 6) from 29.2% in 1983 to 40.7 % in 1987.

To analyze the participation of high growth stocks in high technology industries, the number of firms in four high technology segments was examined. From Table 8, it can be observed that a large proportion of growth stocks were involved in manufacturing computer devices (SIC 3660-3670), which drops off slightly over the five year period. The number of growth firms that participate in information systems (SIC 3570-3577) and software (SIC 7370-7399) and computer equipment almost doubled from 1983 to 1987. The proportion of growth companies which were in high technology sectors, as illustrated in Table 8, were in the range of 17.6% in 1985 to 22.9% in 1983. As can also be observed from Table 8, the proportion of value and mid PE range companies involved in high technology areas is much smaller than it is for growth stocks.

There does not appear to be an increasing trend in high technology participation in growth stocks during this period. However there may have been some increase in the 1990s. In a comparable sample of growth stocks (reported by Fortune Magazine on September 3, 2001 as the 100 fastest growing companies), 31% were involved in high technology industries identified by the same SIC codes reported in Table 8.

Of course, as mentioned before, the question most investors have is "How well will growth stocks perform in the future?" This is a difficult question. This study shows that growth stocks outperform value stocks over the particular test period of this study. The study also shows that growth stocks (high PE stocks) are fairly well spread out among several industry segments. The implications of these results are that if investors may be able to enhance the performance of their portfolios over the long term by incorporating a diverse group of growth stocks mixed with value stocks and middle PE range stocks into their portfolios.

CONCLUDING REMARKS

Studies generally find that returns on growth stocks, or stocks with high price-to-earnings (P/E) ratios, often lag behind those of value stocks, or stocks with low P/E ratios.   To truly assess the performance of growth stocks, a long-term horizon, assuming a buy-and-hold strategy must be examined and comparable portfolios of value stocks and growth stocks must be included in the study. My study examines the returns of growth stocks versus value stocks over the long-term, up to eighteen years. Consistent with prior studies, the five-year returns of the value stocks exceeded those of growth stocks.   However, the results show that the average return of high PE stocks outperforms that of low PE stocks over long periods, up to 18 years. These results tend to support the efficient market hypothesis and suggest that price-earnings (PE) ratios do, in fact, reflect what investors think about the future growth opportunities.

The study also shows that growth stocks (high PE stocks) are fairly balanced among several industry segments.   The implications of these results are that if investors are interested in holding their portfolios over the long-term, incorporating a diverse group of growth stocks mixed with value stocks and middle PE range stocks into their portfolios may enhance long-term performance.

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Table 1: Portfolio Formation - 1983					
Returns and Value reported by year					
Year	PE rangeN=153		PE rangeN=461		PE rangeN=153	
	Annual return	Value	Annual return	Value	Annual return	Value
1984	0.173	.83	0.025	.98	-0.145	1.14
1985	0.361	1.13	0.329	1.30	0.237	1.42
1986	0.195	1.35	0.161	1.50	0.069	1.51
1987	-0.082	1.23	-0.011	1.49	0.090	1.65
1988	0.191	1.47	0.206	1.79	0.145	1.89
1989	0.258	1.85	0.233	2.21	0.160	2.19
1990	-0.091	1.68	-0.112	1.96	-0.149	1.86
1991	0.392	2.34	0.360	2.67	0.392	2.59
1992	0.176	2.75	0.143	3.05	0.294	3.36
1993	0.111	3.06	0.168	3.56	0.297	4.36
1994	-0.076	2.83	-0.005	3.55	0.101	4.79
1995	0.307	3.69	0.236	4.39	0.287	6.17
1996	0.148	4.24	0.216	5.33	0.162	7.17
1997	0.346	5.71	0.322	7.05	0.227	8.80
1998	0.079	6.16	0.019	7.18	-0.015	8.66
1999	-0.116	5.44	-0.026	7.00	0.390	12.05
2000	0.273	6.93	0.038	7.26	0.012	12.19
2001	-0.058	6.53	0.100	7.99	0.007	12.28
Annualized Holding Return	0.148		0.126		0.143	

Graph 1: Portfolio Formation - 1983
Value reported by year
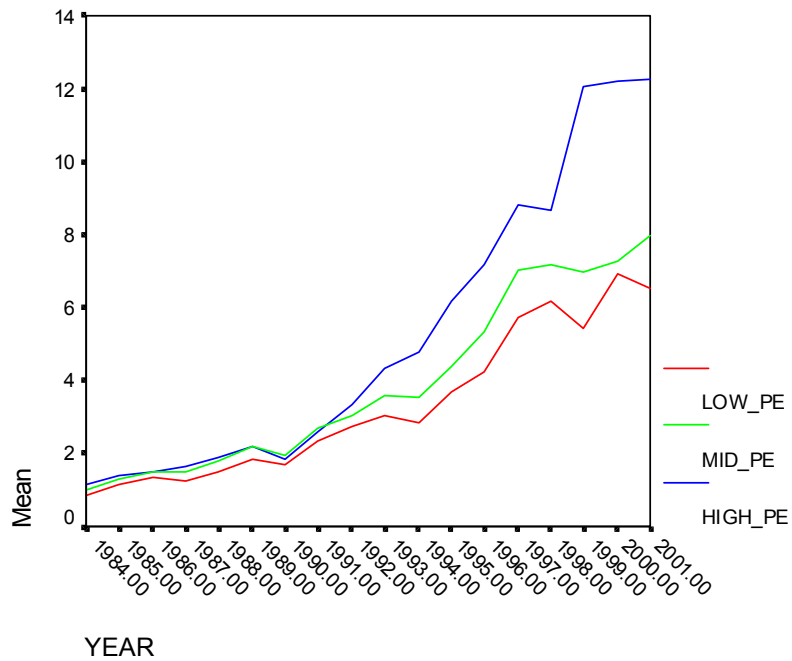
Table 2: Portfolio Formation - 1984						
Returns and Value reported by year						
Year	PE range N=168		PE range N=503		PE range N=168	
	Annual return	Value	Annual return	Value	Annual return	Value
1985	0.339	1.34	0.317	1.32	0.317	1.32
1986	0.199	1.61	0.150	1.51	0.102	1.45
1987	-0.064	1.50	0.006	1.52	0.034	1.50
1988	0.226	1.84	0.192	1.82	0.140	1.71
1989	0.201	2.21	0.217	2.21	0.216	2.08
1990	-0.111	1.97	-0.112	1.96	-0.146	1.78
1991	0.395	2.74	0.348	2.65	0.417	2.52
1992	0.196	3.28	0.173	3.10	0.244	3.13
1993	0.128	3.70	0.177	3.65	0.277	4.00
1994	-0.067	3.45	0.011	3.69	0.062	4.24
1995	0.296	4.47	0.250	4.62	0.314	5.58
1996	0.159	5.18	0.210	5.59	0.173	6.54
1997	0.351	7.00	0.330	7.43	0.194	7.81
1998	0.040	7.28	0.022	7.59	0.008	7.87
1999	-0.070	6.77	0.017	7.73	0.328	10.45
2000	0.183	8.01	0.048	8.10	0.070	11.19
2001	-0.073	7.43	0.077	8.73	0.066	11.92
Annualized Holding Return	0.125		0.140		0.157	

Graph 2: Portfolio Formation - 1984
Value reported by year
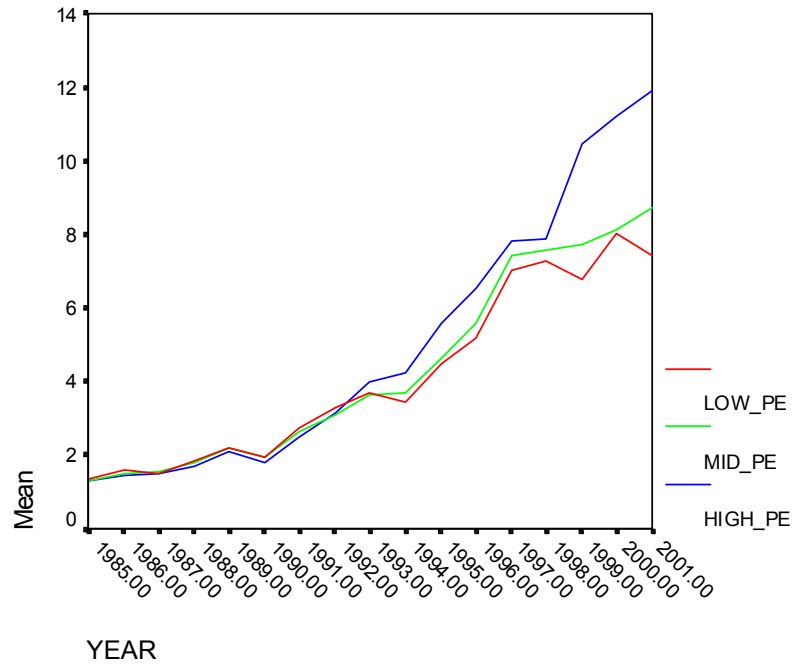
Table 3: Portfolio Formation - 1985					
Returns and Value reported by year					
Year	PE range N=176		PE range N=526		PE range N=176	
	Annual return	Value	Annual return	Value	Annual return	Value
1986	0.256	1.26	0.171	1.17	0.073	1.07
1987	-0.055	1.19	-0.014	1.15	0.084	1.16
1988	0.207	1.43	0.199	1.38	0.134	1.32
1989	0.202	1.72	0.220	1.69	0.220	1.61
1990	-0.119	1.52	-0.106	1.51	-0.135	1.39
1991	0.331	2.02	0.400	2.11	0.421	1.98
1992	0.184	2.39	0.179	2.49	0.206	2.39
1993	0.187	2.84	0.159	2.89	0.344	3.21
1994	-0.057	2.68	-0.004	2.88	0.065	3.41
1995	0.271	3.40	0.254	3.61	0.262	4.31
1996	0.160	3.94	0.199	4.33	0.199	5.17
1997	0.308	5.16	0.316	5.69	0.258	6.50
1998	0.018	5.25	0.025	5.84	0.065	6.92
1999	-0.050	4.98	-0.002	5.83	0.325	9.17
2000	0.206	6.01	0.087	6.33	0.050	9.63
2001	-0.043	5.75	0.098	6.95	0.092	10.51
Annualized Holding Return	0.116		0.129		0.158	

Graph 3: Portfolio Formation - 1985
Value reported by year
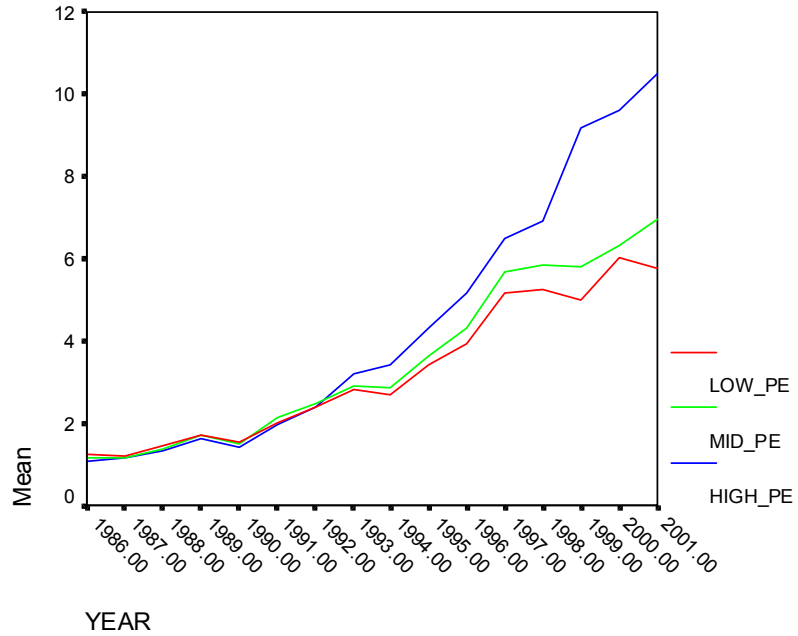
	Table 4: Portfolio Formation - 1986					
	Returns and Value reported by year					
Year	PE range N=186		PE range N=563		PE range N=186	
	Annual return	Value	Annual return	Value	Annual return	Value
1987	-0.063	0.94	-0.015	0.98	-0.044	0.96
1988	0.195	1.12	0.194	1.18	0.154	1.10
1989	0.227	1.37	0.217	1.43	0.183	1.31
1990	-0.135	1.19	-0.093	1.30	-0.153	1.11
1991	0.471	1.75	0.377	1.79	0.493	1.65
1992	0.201	2.10	0.176	2.10	0.203	1.99
1993	0.188	2.49	0.160	2.44	0.302	2.58
1994	-0.064	2.33	-0.009	2.42	0.084	2.80
1995	0.316	3.07	0.255	3.03	0.245	3.49
1996	0.215	3.73	0.206	3.66	0.161	4.05
1997	0.375	5.12	0.307	4.78	0.225	4.96
1998	0.015	5.20	0.039	4.97	0.035	5.14
1999	-0.065	4.86	-0.016	4.89	0.275	6.55
2000	0.203	5.85	0.085	5.30	-0.018	6.43
2001	0.012	5.92	0.109	5.88	0.152	7.41
Annualized Holding Return	0.126		0.125		0.143	

Graph 4: Portfolio Formation - 1986
Value reported by year
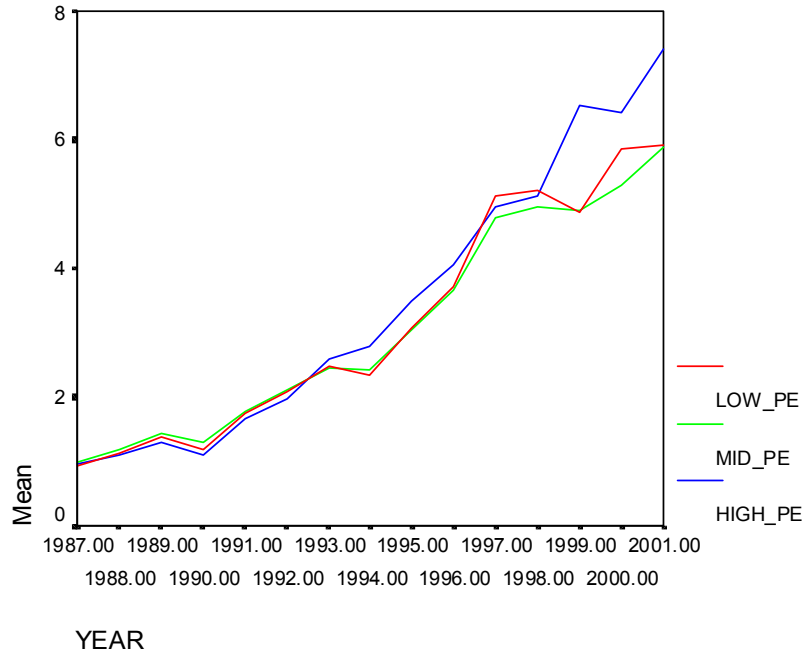
	Table 5: Portfolio Formation - 1987					
	Returns and Value reported by year					
Year	PE range N=214		PE range N=646		PE range N=214	
	Annual return	Value	Annual return	Value	Annual return	Value
1988	0.257	1.26	0.127	1.13	0.015	1.01
1989	0.251	1.57	0.207	1.36	0.152	1.17
1990	-0.203	1.25	-0.099	1.23	-0.145	1.00
1991	0.509	1.89	0.390	1.71	0.426	1.43
1992	0.210	2.29	0.153	1.97	0.242	1.77
1993	0.180	2.70	0.155	2.27	0.343	2.38
1994	-0.045	2.58	-0.008	2.25	0.077	2.56
1995	0.316	3.40	0.248	2.81	0.249	3.20
1996	0.224	4.16	0.214	3.41	0.191	3.81
1997	0.354	5.63	0.306	4.46	0.216	4.63
1998	-0.008	5.58	0.038	4.62	0.074	4.97
1999	-0.038	5.37	0.000	4.62	0.319	6.56
2000	0.201	6.45	0.046	4.84	0.029	6.75
2001	0.094	7.06	0.083	5.24	0.079	7.28
Annualized Holding Return	0.150		.125		.152	

Graph 5: Portfolio Formation - 1987
Value reported by year
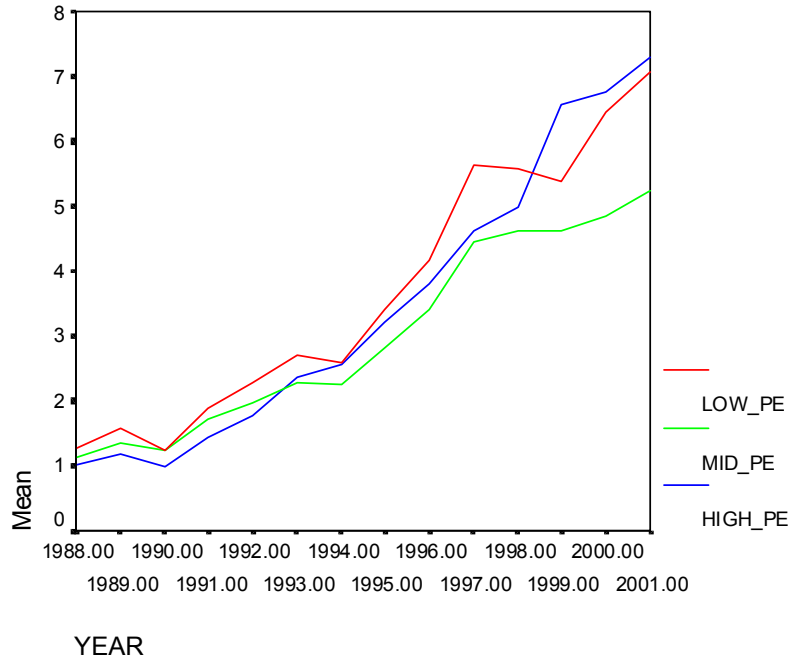
Table 6: Performance Summaries of Portfolios by Formation Year				
Five Year Performance Summary				
Portfolio Formation Year	Value Stocks	Middle Stocks	Growth Stocks	S&P Index
1983	1.47	1.79	1.89	1.68
1984	2.21	2.21	2.08	2.11
1985	1.52	1.51	1.39	1.56
1986	1.75	1.79	1.65	1.72
1987	2.29	1.97	1.77	1.76
Ten Year Performance Summary				
Portfolio Formation Year	Value Stocks	Middle Stocks	Growth Stocks	S&P Index
1983	3.06	3.56	4.36	2.83
1984	3.45	3.69	4.24	2.75
1985	3.40	3.61	4.31	2.92
1986	3.73	3.66	4.05	3.06
1987	5.63	4.46	4.63	3.93
Fourteen Year Performance Summary				
Portfolio Formation Year	Value Stocks	Middle Stocks	Growth Stocks	S&P Index
1983	5.71	7.05	8.80	5.88
1984	7.28	7.59	7.87	7.35
1985	4.98	5.83	9.17	6.95
1986	5.85	5.30	6.43	5.45
1987	7.06	5.24	7.28	4.65

Table 7: Industry Analysis											
PE	SIC code	1983		1984		1985		1986		1987	
low		Freq	Prct	Freq	Prct	Freq	Prct	Freq	Prct	Freq	Prct
	0	1	0.6	0				1	0.5		
	1	2	1.3	3	1.8	4	2.3	4	2.2	12	5.6
	2	17	11.0	22	13.1	16	9.1	14	7.5	28	13.1
	3	9	5.8	23	13.7	35	19.9	24	12.9	34	15.9
	4	73	47.4	73	43.5	76	43.2	57	30.6	37	17.3
	5	7	4.5	4	2.4	7	4.0	7	3.8	12	5.6
	6	45	29.2	42	25.0	35	19.9	76	40.9	87	40.7
	7	0		1	0.6	2	1.1	1	0.5	2	0.9
	8	0		0				1	0.5	1	0.5
	9	0		0		1	0.6	1	0.5	1	0.5
	Total	154	100.0	168	100.0	176	100.0	186	100.0	214	100.0
mid	0			2	0.4	2	0.4	1	0.2	2	0.3
	1	26	5.6	17	3.4	21	4.0	16	2.8	15	2.3
	2	133	28.5	126	25.0	135	25.7	151	26.8	161	24.9
	3	125	26.8	154	30.6	133	25.3	143	25.4	162	25.1
	4	38	8.2	53	10.5	51	9.7	67	11.9	92	14.2
	5	56	12.0	59	11.7	60	11.4	61	10.8	80	12.4
	6	50	10.7	52	10.3	82	15.6	77	13.7	80	12.4
	7	27	5.8	30	6.0	30	5.7	35	6.2	42	6.5
	8	5	1.1	3	0.6	5	1.0	6	1.1	4	0.6
	9	6	1.3	7	1.4	7	1.3	6	1.1	8	1.2
	Total	466	100.0	503	100.0	526	100.0	563	100.0	646	100.0
high	0	1	0.7	1	0.6	1	0.6	2	1.1	2	0.9
	1	11	7.2	21	12.5	14	8.0	17	9.1	25	11.7
	2	17	11.1	24	14.3	26	14.8	25	13.4	33	15.4
	3	77	50.3	51	30.4	55	31.3	64	34.4	66	30.8
	4	4	2.6	4	2.4	8	4.5	10	5.4	12	5.6
	5	15	9.8	22	13.1	26	14.8	29	15.6	23	10.7
	6	9	5.9	22	13.1	21	11.9	15	8.1	21	9.8
	7	12	7.8	15	8.9	20	11.4	19	10.2	24	11.2
	8	6	3.9	8	4.8	5	2.8	4	2.2	6	2.8
	9	1	0.7	0				1	0.5	2	0.9
	Total	153	100.0	168	100.0	176.0	100.0	186.0	100.0	214.0	100.0

One-digit SIC classifications are as follows: 0 - agriculture products; 1 - natural resources; 2 - manufacturing food products, clothing furniture, paper, plastics; 3 - manufacturing, metals, rubber, electronics, parts, devices, refrigeration, lighting, communication equipment, computers, transporting equipment, electro-medical equipment; 4 - transportation services, communications; 5 - retail sales; 6 - financial institutions; 7 - services, motels, cleaning, funeral, office, software motion pictures; 8 - health services, legal services, education, museum, child care; 9- administration, environmental quality

Table 8: Analysis of high technology sectors					
Panel A. Analysis of value stocks in computer production and sales, communications, and information systems					
SECTOR	Portfolio Formation Year				
	1983	1984	1985	1986	1987
Computer equipment (SIC 3570-3577)	0	0	0	1	0
Computer devices (SIC 3660-3670)	0	1	2	1	1
Communications (SIC 4800-4899)	1	4	6	5	2
Information systems (SIC 7370-7399)	0	1	2	1	1
Total in high technology	1	6	10	8	4
Total growth firms in sample	154	168	176	186	214
Proportion of growth firms in high tech	0.6%	3.6%	5.7%	4.3%	1.9%
Panel B. Analysis of middle PE stocks in computer production and sales, communications, and information systems					
SECTOR	Portfolio Formation Year				
	1983	1984	1985	1986	1987
Computer equipment (SIC 3570-3577)	5	2	7	7	5
Computer devices (SIC 3660-3670)	2	7	10	9	10
Communications (SIC 4800-4899)	7	10	8	10	12
Information systems (SIC 7370-7399)	7	9	8	12	15
Total in high technology	21	28	33	38	42
Total growth firms in sample	466	503	526	563	646
Proportion of growth firms in high tech	4.5%	5.6%	6.3%	6.7%	6.5%
Panel C. Analysis of high growth stocks in computer production and sales, communications, and information systems					
SECTOR	Portfolio Formation Year				
	1983	1984	1985	1986	1987
Computer equipment (SIC 3570-3577)	6	4	2	8	11
Computer devices (SIC 3660-3670)	19	13	14	14	12
Communications (SIC 4800-4899)	1	2	3	2	2
Information systems (SIC 7370-7399)	9	8	12	14	16
Total in high technology	35	27	31	38	41
Total growth firms in sample	153	168	176	186	214
Proportion of growth firms in high tech	22.9%	16.1%	17.6%	20.4%	19.2%

WOMEN AND RISK: AN ANALYSIS OF ATTITUDES AND INVESTMENT BEHAVIOR

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ABSTRACT

This article compares attitudes toward risk and willingness to hold risky assets by male and female-headed households using data from the 1998 Survey of Consumer Finances. According to self-reported data, women expressed a higher level of risk aversion; almost 50 percent indicated that they were not willing to take any financial risks. Further, when investment behaviors were examined, women over 40 years of age held a significantly lower percentage of risky assets than men. Controlling for education and wealth, however, there were no differences between women and men over 40 in terms of their willingness to hold stocks and stock mutual funds.

INTRODUCTION

Finance theory teaches that there is a tradeoff between risk and return. The greater the risk, the greater the return demanded by investors (Lintner, 1965; Sharpe, 1964). Portfolio theory also suggests that although individual investments may be risky on a stand-alone basis, they are less so within the context of a diversified portfolio wherein well-performing investments can offset poor performers (Markowitz, 1952). The objective is to assemble a well constructed portfolio as opposed to trying to hit the jackpot with individual investments.

Prior research suggests that women are more risk averse as investors than men. Thus, they are less likely to select riskier types of investments that might provide higher returns. Similarly, their personal portfolios are relatively undiversified being heavily weighted with low risk, low return types of investments. If this is true, it has serious implications for the types of returns that women can expect to receive and also for their personal wealth, both present and future.

This article will use the 1998 Survey of Consumer Finances to compare attitudes toward risk and types of investments made by women and men in order to determine if women report a higher level of risk aversion, and, if they, in fact, tend to invest less in risky types of assets. Expressed attitudes toward risk are one thing, while actual behaviors are another. Investors may or may not behave in a fashion that is consistent with their self-professed attitudes and beliefs.

The article is organized into five sections of which this is the first. The second section includes a review of prior research and findings relative to women's investment behavior. The third section describes the sample including univariate results and a description of the multivariate models. Section 4 provides multivariate results, and Section 5 includes a discussion of the findings as well as directions for further research. The unique contribution of this research is that it demonstrates that women's expressed attitudes toward risk do not necessarily translate into more risk

averse investment behavior. Younger women were just as likely to hold risky assets as younger men. This research does demonstrate, however, that more mature women were less willing to hold risky assets than mature men, although, controlling for education and wealth, they did hold the same level of stocks and stock mutual funds.

WOMEN AND RISK: PRIOR RESEARCH

Although a considerable amount of research has been done on attitudes toward risk (Cohn et al, 1975; Morin & Suarez, 1983; Riley & Chow, 1992), relatively little has been done on gender differences and their implications for investment behavior. The work that has been done, however, seems to point to greater risk aversion on the part of women investors and, correspondingly, to more conservative investment choices.

In a study of defined contribution pension plans, Bajtelsmit and VanDerhei (1997) found that women were more likely to invest in fixed income alternatives and less likely to invest in stock Similarly, Hinz et al. (1997) found that a large percentage of women invested in the minimum risk portfolio available when given a range of pension alternatives. Using the 1989 Survey of Consumer Finances, Jianakoplos and Bernasek (1998) found that single women held a lower percentage of risky assets than single men or married couples. Schooley and Worden (1996) found, however, that gender was not significant if life cycle and employment were held constant. Also using the 1989 Survey of Consumer Finances, Bajtelsmit et al. (1999) found that women demonstrated greater relative risk aversion than men in their allocation of wealth into defined contribution pension plans. Similarly, using the 1992 and 1995 Surveys of Consumer Finances, Sunden and Surett (1998) found that both gender and marital status affected the ways in which individuals allocated assets in defined contribution plans with women making more conservative choices than men. Harrihan et al. (2000) found that, even controlling for differences in risk tolerance, women were more likely to invest in risk-free securities than men.

Prior research suggesting that women are less willing to invest in risky assets has several worrisome implications. First, women typically live longer than men (Edmondson, 1997), and Social Security provides only a minimal level of financial support during retirement. Thus, women need additional financial resources to maintain their standard of living during their retirement years. Second, women earn less than men (Bowler, 1999) and are less likely to be promoted into positions that would lead to a higher level or earnings (Cobb-Clark & Dunlop, 1999). Further, women typically work fewer years than men, because many women take time away from full time employment to have children and to remain at home with them for several months or years. As a result, many women may be "out of the loop" in terms of career advancement in the form of promotions, bonuses, and salary increases for a period of years, placing them permanently "behind" men in earning power. Third, half of the marriages in the United States end in divorce. Although child custody arrangements are becoming more equitable, and the male parent is typically required to provide some level of financial support, women continue to be the primary care givers and custodians for minor children. In light of each of these considerations, it is particularly important for women to accumulate assets and to earn a respectable return on them.

This research will examine attitudes toward risk and asset choices on the part of both women and men. It will also discuss implications of the findings and directions for further study.

EMPIRICAL ANALYSIS

Data for this study were drawn from the 1998 Survey of Consumer Finances (SCF) conducted on a triennial basis by the Federal Reserve. The 1998 SCF is the most recent survey for which data are publicly available and includes financial and other information on 4,305 households. The survey, which lasts from 1 1/2 to 3 hours, collects information on household assets and liabilities, use of financial products and financial service providers, and employment.

Descriptive statistics for households included in the SCF are provided in Table 1; variables included in the table are defined in Appendix A. Table 1 reveals that the mean age for respondents was 49.86 years suggesting a relatively mature sample of respondents. In terms of marital status, 59.9 percent of the respondents were married while the average family size was 2.48 persons. Approximately 19 percent of the respondents described themselves as members of a racial or ethnic minority, either black, Hispanic, Asian, or American Indian. In general, this was a relatively well-educated group of respondents; 61.7 percent indicated that they had attended college.

As Table 1 reveals, household income and net worth figures were highly skewed due to the survey's deliberate over-sampling of high income households. This technique was employed to ensure that an adequate number of households would actually use the financial products and services addressed in the SCF. Average total income was $434,458 while the median household income was a much more modest $49,000. Similarly, average household net worth was $5.5 million compared to a median of $150,900. For purposes of analysis, net worth was set at zero for those households having a net worth of less than zero.

Table 1: Descriptive Statistics for Households Included in the 1998 Scf			
Variable	Mean	Standard Dev.	Median
AGE	49.86	16.54	49
FAMSIZE	2.48	1.37	2
TOTINC	$434,458	$3,806,454	$49,000
NETWORTH[4]	$5,506,522	$27,931,560	$150,900
Percentage of Households by Category			
	YES	NO	
MARRIED	59.9	40.1	
ED	61.7	38.3	
MINORITY	18.7	83.3	

Univariate Results

Univariate analysis of the data comparing men and women heads of household in terms of demographic characteristics, attitudes toward risk, and holdings of financial assets was conducted using t-test and chi-square.   The t-test allows us to test if the means of two groups, in this case women and men, are equal. Chi-square analysis enables us to determine if observed cell frequencies in a two-by-two contingency table differ significantly from expected frequencies. Taken together, the results of these two tests allow us to determine if the characteristics and investment behaviors of women and men are essentially the same or different. Results are included in Tables 2 through 4.

Table 2 reveals that although 76 percent of the male heads of household were married, only about 2 percent of the female heads of household were. Thus, most of the women-headed households included in the survey consisted on single women, divorced women, or widows. Although the men were significantly better educated, over 50 percent of both men and women heads of household had attended college. The two groups were also similar in age with the average age for men being 49.43 years and for women 51.39 years. The average family size was larger for men than for women (2.71 vs. 1.67 persons), in all likelihood because the majority of men were married while the majority of women were not.

Table 2: Demographic Characteristics: Head of Household				
	Men	Women	Chi-square	Probability
	N=3361	N=944		
Characteristic				
Married*	76.14	2.01	1685.667	0.001
Ed*	64.80	50.85	60.758	0.001
Minority*	15.80	29.24	87.381	0.001
			t-test	
Age**	49.43	51.39	-2.8160	0.0049
Famsize**	2.71	1.67	23.9183	0.0001
1997 Totinc**	$541,052	$49,929	6.5807	0.0001
1997 Networth**	$6,709,629	$1,223,001	8.5095	0.0001
*Values are percentages of the total. **Values are integers.				

Income and net worth were significantly different for male-headed households than for female-headed households. The average 1997 household income for a male-headed household was $541,021 compared to $49,929 for a female-headed household. As noted above, however, household incomes were highly skewed. For male-headed households, the median household income was only $63,000, while for women it was $18,000. Twenty-five percent of the women in

this sample had household incomes of less than $10,000. The average 1997 net worth for a male-headed household was significantly higher at $6,709,629 compared to $1,233,001 for a female-headed household. As in the case of household income, net worth was highly skewed. Male-headed households had a median net worth of $238,190 while women had a median of $27,390. One might anticipate that the dramatic differences between men and women in income and household wealth would have an impact on investment attitudes and choices.

Table 3 reveals that men were significantly more likely to have various types of savings and investment products than women. Several types of products are of particular interest. Although 45.61 percent of the male-headed households reported having an IRA, only 20.44 percent of the women-headed households had one, suggesting that unmarried women are less well prepared to fund their retirement needs. Similarly, although 26.15 percent of the male-headed households reported having a stock mutual fund, only 11.33 percent of the female-headed households had this type of investment. Thirty-seven percent of the male-headed households held stock directly compared to only 15.25 percent of the female-headed households. Since stocks provide higher returns over time, this discrepancy suggests that men are more likely to hold higher yielding types of investments than women.

Table 3: Percentage of Households with Accounts				
	Men	Women	Chi-square	Probability
Type of Account				
Checking	92.00	80.30	106.733	0.001
IRA	45.61	20.44	194.342	0.001
Money Market	13.84	6.99	31.922	0.001
CD	15.98	16.53	0.164	0.686
Savings	51.32	50.42	0.239	0.625
Mutual Fund	28.53	13.45	88.849	0.001
Stock Mutual Fund	26.15	11.33	91.647	0.001
Bond Mutual Fund	11.10	6.78	15.068	0.001
Stock	37.10	15.25	160.847	0.001
Bonds	31.75	14.72	105.892	0.001
Attitudes toward Risk[5]				
High Risk	32.94	16.95	99.700	0.001
Some Risk	42.13	33.37	23.533	0.001
No Risk	24.93	49.68	213.514	0.001

Attitudes toward risk, also included in Table 3, point to differences between men and women as well. Almost 33 percent of the men indicated that they would be willing to take above average risk in order to earn above average returns. Only 16.95 percent of the women indicated that they were willing to take above average risks. Forty-two percent of the men responded that they would be willing to take some risk compared to 33.37 percent of the women. Most revealing, 49.68 percent of the women responded that they did not want to take any risks compared to only 24.93 percent of men. All of these differences are significant and point to greater risk aversion on the part of women.

Another way of exploring attitudes toward risk is to examine the relative weight of the various types of assets that comprise total financial assets. Table 4 shows that women's investments in financial assets were more heavily concentrated in low-yielding types of assets including checking accounts, savings accounts, and CDs. Women were significantly more likely to keep a higher percentage of their financial assets in these types of accounts than men (49.30% vs. 30.19%). Correspondingly, men kept higher percentages of their financial assets in higher yielding types of assets including stocks and stock mutual funds (16.80 vs. 9.58 %).

Table 4: Financial Assets as a Percentage of Total Financial Assets				
	Men	Women	t-value	Probability
Asset				
Checking Account	17.14	25.57	-6.2345	0.0001
IRA	12.54	7.67	6.2715	0.0001
Money Market	2.16	1.44	2.2124	0.0271
CD	3.68	7.73	-5.1484	0.0001
Savings Account	9.37	16.00	-6.3548	0.0001
Stock Mutual Fund	5.42	3.31	4.4913	0.0001
Bond Mutual Fund	1.51	1.33	0.6254	0.5318
Stock	11.38	6.27	6.8552	0.0001
Bonds	4.41	2.77	3.5432	0.0004

Multivariate Analysis

The major hypothesis of this article is that attitudes toward risk and investment in various types of financial assets are affected by characteristics of the investor (including gender) and his or her household. This research seeks to identify those characteristics that serve as the strongest predictors of attitudes toward risk and the allocation of assets into safe and risky categories.

To achieve this end, a logistic regression model was developed in which the dependent variable was either HIGHRISK, SOMERISK, or NORISK reflecting different levels of risk aversion. Logistic regression was employed in this instance because the dependent variables were dichotomous (0,1) variables.

The logistic regression model took the following form:

$$HIGHRISK = a_0 + \overset{(-)}{b_1 GENDER} + \overset{(+)}{b_2 MINORITY} + \overset{(+)}{b_3 MARRIED} + \overset{(+)}{b_4 ED} + \overset{(-)}{b_5 AGE} + \overset{(-)}{b_6 FAMSIZE} + \overset{(+)}{b_7 LOGNW} + e^1$$

GENDER was used as an independent variable because, as noted above, most prior research on gender and attitudes toward risk and investment behavior indicates that women are more risk averse than men and select more conservative financial alternatives (Bajtelsmit & VanDerhei, 1997, Harrihan et al., 2000, Hinz et al., 1997, Jianakoplos & Bernasek, 1998, Sunden & Surett, 1998). Thus, one would anticipate a negative sign in the HIGHRISK model for the variable GENDER. The variable MINORITY was included to determine if members of racial or ethnic minority groups are less likely to hold risky assets. Prior research suggests that minority investors hold a higher percentage of risky assets (Schooley & Worden, 1996) leading us to expect a positive sign for this variable. The variable MARRIED was used to test whether single individuals are more prone to take risks than married ones. Hinz et al. (1997) found that married individuals invested more conservatively, and Sunden and Surette (1998) also found that married women invested more conservatively than single women or men. Schooley and Worden (1996) found that married individuals held a higher percentage of risky assets, however. They theorized that married couples may be willing to accept higher investment risk because they have two sources of income. The variable ED representing years of education is a measure of human capital. Prior research suggests that more highly educated individuals are more aware of the full range of investment alternatives and their possible returns. In addition, they should be more willing to take greater risks because they have sufficient human capital to compensate for possible losses (Harrihan et al., 2000). Given that, one would expect a positive sign for the variable ED in the HIGHRISK model.

AGE was included to determine if risk aversion increases with age as is suggested by prior research (Bajtelsmit & VanDerhei, 1997; Morin & Suarez, 1983). As individuals approach retirement age, they are less willing to invest in risky assets and are more concerned with preserving rather than enhancing wealth. This would lead one to anticipate a negative sign for the variable AGE in the HIGHRISK model. FAMSIZE measures the size of the primary economic unit or household. Individuals having larger households may be less willing to take risks because more individuals would be negatively affected by possible losses. Thus, one would anticipate a negative sign for this variable as well. LOGNW is a measure of household wealth. Since the net worth values were highly skewed for this sample, the logged form of the variable was used. A considerable body of prior research indicates that risk aversion declines as wealth increases (Cohn et al., 1975; Jianakoplos & Bernasek, 1998; Morin & Suarez, 1983; Riley & Chow, 1992). Thus, wealthy individuals are more likely to hold higher risk investments that offer opportunities for higher returns.

The independent variables employed in the model are defined in Appendix A. A correlation analysis revealed that the independent variables are not highly correlated (Table 5).

Table 5: Correlation Table of Independent Variables							
Variable	GENDER	MINOR	MARRIED	ED	AGE	FAMSIZE	LOGNW
GENDER	1.00	0.14	-0.62	-0.11	0.04	-0.31	-0.29
MINOR	0.14	1.00	-0.15	-0.18	-0.19	0.08	-0.30
MARRIED	-0.62	-0.15	1.00	0.14	0.09	0.49	0.37
ED	-0.11	-0.18	0.14	1.00	-0.02	0.02	0.39
AGE	0.04	-0.19	0.09	-0.02	1.00	-0.29	0.36
FAMSIZE	-0.31	0.08	0.49	0.02	-0.29	1.00	0.06
LOGNW	-0.29	-0.30	0.37	0.39	0.36	0.06	1.00

RESULTS

Risk Preferences

Table 6 includes the results of the logistic regression analysis. Gender was a significant variable for both the HIGHRISK and LOWRISK models indicating that men are significantly more likely to express the willingness to take above average risks, while women are significantly more likely to express unwillingness to take any risk at all. The variable MINORITY was significant and negative for the SOMERISK model and significant and positive for the NORISK model indicating that members of racial and ethnic minorities were less likely to accept some risk and more likely to prefer no risk whatsoever.

Educational level and wealth as measured by the log of net worth were significant for all three models. More highly educated individuals and more affluent households were more likely to express willingness to take either high risks or some risk. Alternatively, individuals with less education and lower wealth were more likely to express unwillingness to take any risks.

Marital status, family size, and age also appear to have an impact. Unmarried individuals were significantly more likely to be willing to take high risks, while married households were significantly more likely to accept at least some risk. Similarly, heads of household having smaller families were willing to accept some risk, while those with larger families were more likely to choose the "no risk" alternative. Finally, consistent with prior research on the effect of age, younger individuals were more willing to accept high risk, whereas older heads of household were significantly more likely to express unwillingness to take any risk.

Table 6: Logistic Regression: Attitudes Toward Risk			
Dependent Variables			
	HIGHRISK	SOMERISK	NORISK
-2 Log Likelihood	637.427	79.242	1054.507
Chi-Square	0.0001[a]	0.0001	0.0001
Independent Variables			
GENDER	-0.3693[b]	-0.0652	0.3650
	0.0058**	0.4411	0.0043**
MINORITY	-0.1009	-0.3261	0.4538
	0.3740	0.0008**	0.0001**
MARRIED	-0.2528	0.2786	0.0442
	0.0297*	0.0068**	0.7279
ED	0.6002	0.2442	-0.8156
	0.0001**	0.0013**	0.0001**
AGE	-0.0432	-0.0045	0.0448
	0.0001**	0.0721	0.0001**
FAMSIZE	-0.0103	-0.1033	0.0882
	0.7658	0.0010**	0.0233*
LOGNW	0.3053	0.0314	-0.4051
	0.0001**	0.0430*	0.0001**

[a] Pr>Chi-Square   [b] parameter estimate
* results significant at .05 level   **results significant at .01 level

Holdings of Stock or Stock Mutual Funds

As a second step in this analysis a dependent variable, STOCKP, representing stock and stock mutual funds as a percentage of net worth (total household assets minus total household liabilities) was created. Stocks and stock mutual funds represent riskier types of investments, because there are no guarantees for returns. Thus, a risk averse investor should be less willing to hold them or should hold a lower percentage. We hypothesized that women, who expressed a higher level of risk aversion as noted above, should be less willing to hold stocks and stock mutual funds. To test this hypothesis, a regression model was constructed having the following form:

$$\text{STOCKP} = a_0 + \overset{(-)}{b_1 \text{GENDER}} + \overset{(-)}{b_2 \text{MINORITY}} + \overset{(-)}{b_3 \text{MARRIED}} + \overset{(+)}{b_4 \text{ED}} + \overset{(-)}{b_5 \text{AGE}} + \overset{(-)}{b_6 \text{FAMSIZE}} + \overset{(+)}{b_7 \text{LOGNW}} + e^2$$

The data were divided into two samples by age to differentiate between younger and more mature investors. Prior research clearly indicates that younger investors with a longer time horizon demonstrate different investment behaviors than those approaching or in retirement (Bajtelsmit & VanDerhei, 1997, Bellante & Saba, 1986, Morin & Suarez, 1983, Riley & Chow, 1992, Schooley & Worden, 1996). The first sample included heads of household who were less than 40 years old, while the second sample included heads of household who were 40 or older. The results for both samples are shown in Table 7.

Table 7: Results of Regression Model (Ordinary Least Squares) Holdings of Stock and Stock Mutual Funds as a Percentage of Net Worth		
	Age<40	Age>=40
F Value	7.180	72.085
Prob>F	0.0001	0.0001
R-Square	0.0477	0.1480
Independent Variables		
INTERCEPT	-0.0130[a]	-0.2236
	0.7272[b]	0.0001**
GENDER	0.0113	0.0045
	0.4798	0.6657
MINORITY	-0.0088	-0.0115
	0.4951	0.2177
MARRIED	0.0168	-0.0045
	0.2785	0.6387
ED	0.0433	0.0338
	0.0003**	0.0001**
AGE	-0.0021	0.0522
	0.0004	0.0832
FAMSIZE	-0.0023	-0.0051
	0.6151	0.0950
LOGNW	0.0108	0.0221
	0.0002**	0.0001**
[a] parameter estimate [b] prob>t **results significant at the .01 level		

Table 7 reveals that, for both age groups, heads of household having a higher level of education and higher wealth in the form of net worth held a higher percentage of stocks and stock mutual funds. Gender was not, however, a significant variable for either age group. This suggests that, controlling for other factors such as education, and wealth, women were just as willing to hold

stocks and stock mutual funds as men. A possible shortcoming of this analysis is that it does not capture holdings of stock or stock mutual funds held in IRAs, 401ks, or pension funds. The Survey of Consumer Finances does not allow for a precise breakdown of those asset holdings.

Holdings of Risky Assets

As a final step in the analysis of actual investment behavior as opposed to expressed attitudes toward risk, the overall holdings of risky assets as a percentage of net worth were examined. This is the approach employed in Friend & Blume (1975), Cohn et al. (1975), Morin & Suarez (1983), and Cohn & Coleman (2000). Total household assets were divided into "safe assets" and "risky assets". Safe assets included those assets promising a relatively certain stream of income or benefits to the asset holder. Risky assets included those assets having a less predictable stream of income or benefits. The breakdown for the safe and risky asset categories is included in Appendix B.

To explore the relationship between holdings of risky assets and various explanatory variables, the following regression model was developed:

$$RISKP = a_0 + b_1 \overset{(-)}{GENDER} + b_2 \overset{(-)}{MINORITY} + b_3 \overset{(-)}{MARRIED} + b_4 \overset{(+)}{ED} + b_5 \overset{(-)}{AGE} + b_6 \overset{(-)}{FAMSIZE} + b_7 \overset{(+)}{LOGNW} + e^3$$

The independent variables used in the model have previously been defined. The dependent variable, RISKP, is the ratio of risky assets to household net worth. As above, the sample was divided into a "younger" group with heads of household who were less than 40 years of age and a "mature" group who were 40 or older. Results for both samples are shown in Table 8.

The first noteworthy finding is that, although gender was not significant for the under-40 sample, it was negative and highly significant for the 40-and-over sample. This finding reveals that, although there were no differences between younger women and men, more mature women heads of household held a lower level of risky assets as a percentage of net worth than men did. Similarly, married heads of household held a significantly lower level of risky assets in the 40-and-over sample.

The variable representing educational level was positive and highly significant for both samples suggesting that individuals who have attended college may develop information-seeking and critical thinking skills that would enable them to learn about and evaluate a broader array of investment alternatives. It may also suggest that more highly educated individuals are willing to take greater financial risks, because they have sufficient human capital to compensate for possible losses.

These findings also reveal that for the "mature" group, heads of household at the younger end of the age range were willing to hold a higher percentage of risky assets than older heads of household. This finding is consistent with prior research indicating that as individuals approach and enter their retirement years, their willingness to hold risky assets declines.

Table 8: Results of Regression Models (Ordinary Least Squares)		
Dependent Variable=Risky Assets/Household Net Worth		
	Age<40	Age>=40
F Value	2.350	58.841
Prob>F	0.0220	0.0001
R-Square	0.0161	0.1242
Independent Variables		
INTERCEPT	2.6791[a]	-0.0988
	0.0339*[b]	0.2687
GENDER	-0.4614	-0.1846
	0.3960	0.0001**
MINORITY	-0.7243	-0.0355
	0.0984	0.3073
MARRIED	0.1228	-0.1468
	0.8152	0.0001**
ED	1.0461	0.1035
	0.0101*	0.0001**
AGE	0.0032	-0.0044
	0.9307	0.0001**
FAMSIZE	0.2392	-0.0103
	0.1318	0.3595
LOGNW	-0.3093	0.0703
	0.0014**	0.0001**

[a] parameter estimate
[b] prob>t
* results significant at the .05 level
**results significant at the .01 level

The log of net worth was significant and negative for the under-40 sample and significant and positive for the 40-and-over sample. This suggests that for younger households, lower wealth is associated with a greater willingness to accept risk, possibly because those households have relatively little to lose and have a long time horizon before them. Alternatively, for more mature households, consistent with prior research, greater wealth is associated with greater willingness to hold risky assets. This may lead to a "the rich get richer" phenomenon, since higher net worth households are willing to invest in the types of assets that will provide higher returns.

DISCUSSION

The results of this study demonstrate that women express a higher level of risk aversion than men. When questioned on their attitudes toward risk, women heads of household were significantly less willing to accept high risk in exchange for higher returns and significantly more willing to accept no risk.

Since self-expressed attitudes do not necessarily translate into behavior, women's actual holdings of risky assets were also examined. Table 7 reveals that, holding education and wealth constant, women held the same level of stock and stock mutual funds as a percentage of net worth as men. Table 8 also demonstrates that there were no gender differences in willingness to hold risky assets overall for individuals under the age of 40. Women who were 40-and-over, however, held a significantly lower level of risky assets than men in the same age category.

These findings suggest several possible explanations. First, younger women may have more access to financial information and greater awareness of investment alternatives than more mature women. This could be because most of most of them are active in the workplace, or alternatively it could be because they have recently participated in courses and seminars, or are more likely to use the Internet to gather financial information.

These findings may also suggest that mature women are particularly risk averse, because they are concerned about their prospects for the future. As has been noted, women live longer than men and have lower earnings and wealth than men. Thus, older women may be more focused on preserving the assets they have rather than augmenting them. They may feel that they are not in a position to suffer losses as they approach or enter their retirement years and may avoid more speculative types of investments.

It is noteworthy that, although women over 40 held a lower level of risky assets in total, there were no gender differences, controlling for education and wealth, in terms of willingness to hold stock or stock mutual funds. Given the robust performance of the stock market during the mid- and late-90s, this could be because investors no longer regard stocks as being particularly risky. In fact, during that time period, just about everyone who invested made money in the stock market due to the buoyancy of the market overall. It will be important to determine if gender differences do appear in a more volatile and less benign period for the market such as that in which we now find ourselves.

This research also reveals that the allocation of financial assets into risky versus less risky types of assets is a function of educational level, wealth, marital status, and, to a certain extent, age. More highly educated individuals and wealthier individuals are more willing to take financial risks, possibly because they have a "cushion" of either financial capital or human capital to offset possible losses. More highly educated individuals may also be more aware of investment alternatives and the risk/return tradeoff. Married heads of household over 40 held a lower level of risky assets, possibly due to a desire to preserve assets rather than placing them at risk. Similarly, older heads of household in the 40-and-over sample held a lower percentage of risky assets.

The unique contribution of this article is that it demonstrates that, although women expressed a higher level of risk aversion, there was no difference between younger women and men in terms of their willingness to hold risky types of assets. Correspondingly, however, more mature women demonstrated investment behaviors that were different from those of mature men. Although the

Survey of Consumer Finances provides some attitudinal data, it does not provide sufficient detail to determine why this might be the case. Thus, there is ample opportunity for further research on why mature women make the investment choices they do.

ENDNOTES

[1]   Signs in parentheses indicate the expected sign of the coefficients.

[2]   Signs in parentheses indicate the expected sign of the coefficients.

[3]   Signs in parentheses indicate the expected sign of the coefficients.

[4]   Households having a net worth of less than 0 were assigned a value of 0.

[5]   Values indicate the percentage of respondents falling into the category.

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Appendix A
Definition of Variables

Dependent Variables:	
HIGHRISK:	dichotomous variable coded as a "1" if the respondent is willing to take either substantial financial risks or above average financial risks to earn higher returns
SOMERISK:	dichotomous variable coded as a "1" if the respondent is willing to take average financial risks in order to earn an average return
NORISK:	dichotomous variable coded as a "1" if the respondent is not willing to take any financial risks
STOCKP:	ratio of stock and stock mutual funds as a percentage of net worth
RISKP:	ratio of risky assets (see Appendix B) as a percentage of net worth
Independent variables:	
GENDER:	dichotomous variable; 1=female
MINORITY:	dichotomous variable; 1= the head of household was a member of a racial or ethnic minority group including black, Hispanic, Asian, or American Indian
MARRIED:	dichotomous variable; 1=married
ED:	dichotomous variable; 1=at least 1 year of college
AGE:	age of head of household
FAMSIZE:	number of people in the primary economic unit (household)
LOGNW:	log of 1997 net worth (total household assets minus total household liabilities)

Appendix B
Definition of "safe" and "risky" assets
Safe assets include checking accounts, money market accounts, CDs, savings accounts, tax free mutual funds, government bond mutual funds, savings bonds, mortgage backed bonds, U.S. government bonds, tax free bonds, corporate bonds, the value of life insurance policies, the personal residence, vehicles, and the fixed income portion of combination funds, annuities, trusts, IRAs, and pensions.
Risky assets include stock mutual funds, stock, foreign bonds, brokerage accounts, investment real estate, equity held in a business, the non-fixed income portion of combination funds, annuities, trusts, IRAs and pensions, loans to businesses and individuals, and land contracts.
Assets held in combination funds, IRAs, 401ks, pensions, annuities, and trusts were allocated to the risky and safe categories in accordance with their relative holdings of stock or other types of risky assets since the Survey of Consumer Finances does not provide an exact breakdown of these types of assets.

PUBLICATION GUIDELINES FOR ALLIED ACADEMIES' JOURNALS

JoAnn C. Carland, Western Carolina University
James W. Carland, Western Carolina University

ABSTRACT

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where:
Z = *Dependent Variable...*
b_i = *Independent Variable 1...*
j_i = *Independent Variable 2...*

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More Descriptive Information	2	4	6	8	10	12	14	16	18	20	22	24	26	28
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More Descriptive Information	2	4	6	8	10	12	14	16	18	20	22	24	26	28
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